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INCORPORATED A. D. 1799
VOLUME XVIII 1913-15

Publications of Yale University

The Transactions of the Connecticut Academy, pages 347-447 of volume 18, containing Rev. Clarence R. Williams's monograph upon the Appendices to the Gospel of Mark, are still in the hands of the printer in Germany. Owing to the European war its distribution will be delayed.

J. C. SCHWAB
Librarian of the Connecticut Academy

New Haven, Conn., U. S. A.
November, 1914

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A Monograph of the Terrestrial Palaeozoic Arachnida of North America

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YALE UNIVERSITY PRESS
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PROFESSOR CHARLES SCHUCHERT

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I.—A MONOGRAPH OF THE TERRESTRIAL PALAEOZOIC ARACHNIDA OF NORTH AMERICA

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INTRODUCTION

While European Carboniferous Arachnida have been made the subject of careful study, the results of which are incorporated in two extensive monographs, one by *Fritsch* in 1904 and the other by *Pocock* in 1911, the North American forms have received little attention since the publication of *Scudder's* researches. It is true that a few new forms have been described recently, but no attempt has been made to reinvestigate the whole subject. Moreover, as an extensive knowledge of Arachnology and especially of the external morphology of arachnids, is imperative for a correct interpretation of fossil remains, there is nothing surprising in the fact that errors crept into the diagnoses of *Scudder* and that these were repeated by *Melander*. Another reason for such errors was the fact that *Scudder's* and *Melander's* specimens were not sufficiently cleaned of the white[1] mineral which often entirely concealed the important characters. We find the most striking examples of this in an unpublished specimen belonging to the U. S. National Museum, which has been identified by Scudder as *Graeophonus carbonarius*, while it is in fact a new species of *Anthracomartus*, and in *Kustarachne sulcata* of Melander which is a typical *Curculioides*. Naturally the diagnoses of the genera themselves have likewise suffered from incomplete knowledge of the type specimens. This is rather unfortunate, since it not only necessitates a shifting of the American species from one genus to another, but resulted also in a wrong application of some generic names for European species, an unavoidable error on the part of the European investigators who did not have an opportunity to examine the Ameri-

[1] In some specimens it is calcium carbonate mixed with iron carbonate, n others kaolin.

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can types. I feel therefore quite sure that the European palaeontologists and arachnologists will share with me the feeling of gratification at the great opportunity which was afforded me through the kindness of Professor Schuchert, to reëxamine and redescribe all American types and to extend the investigation over many as yet undescribed specimens. In view of my indebtedness to Professor Schuchert, at whose suggestion I undertook the research, through whose exertions the various collections were placed at my disposal, and who throughout my studies has given me many valuable and stimulating suggestions, it affords me great pleasure to dedicate this monograph to him. My thanks are also due to the U. S. National Museum, the University of Chicago, Harvard University, McGill University, the University of Illinois, Mr. L. E. Daniels, and the Peabody Museum of Yale University for permission to reinvestigate their collections. I also acknowledge with thanks the kind permission given to me by the Encyclopeadia Britannica Company to reproduce two figures of *Liphistius* from the eleventh edition of the Encyclopaedia, and by the University Press of Cambridge six figures from Hansen & Sörensen's monograph "On two Orders of Arachnida."

Every specimen was carefully cleaned under a binocular microscope and the rock covering unexposed parts removed by means of a needle and a small chisel. In some cases the chitin was found still preserved and was examined under higher power. The removal of the white mineral often covering the entire specimen and useful in the detection of appendages concealed in the rock, was not difficult and brought to light many important structures. More difficulties were offered by the rock in which the specimens are imbedded and which had to be removed in some cases to the depth of about $^1/_4$ of an inch. The specimens which are best preserved are nearly all imbedded in very hard nodules, a clay-iron stone, and required great care in handling. The softer rock surrounding other specimens showed all signs of decomposition and here the chiseling was easier but the preservation of the specimens themselves, not so good. After careful study under the binocular with the aid of artificial light which allows a more perfect reflection of the rays from the exposed surfaces, a drawing of each specimen was made by measuring its parts and enlarging them a given number of times. Thus all the text figures represent the specimens more or less correctly as they appear under the microscope. In many cases, however, both halves of the concretion show superimposed imprints of the dorsal and ventral surfaces of the specimen and obscure the actual structure. In such cases the super-

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imposed structures were omitted from the drawing and where possible, each surface was drawn separately. Wherever this was necessary, special reference to it will be found in the text; but to avoid the possible objection of misinterpretation or misconception, all specimens drawn in text were photographed from the originals and are reproduced on the plates directly from the photographs. The photographing was done by Doctor R. S. Bassler of the U. S. National Museum.

The net results of the present investigation are as follows: (1) 101 specimens including all types were studied and found to belong to 42 species distributed over 25 genera; of these, 24 species and 13 genera are new to science; (2) the diagnoses of old genera are corrected in accordance with the new data obtained from the study of the types and of specimens which undoubtedly belong to the type species; (3) the genus *Eoscorpius* was found to be sound and is retained in the system; the genera *Hadrachne* Melander and *Geraphrynus* Scudder were found to be synonyms of *Architarbus* Scudder; (5) the type of *Geraphrynus carbonarius* was found to be in every detail identical with the type of *Architarbus rotundatus*, the former name being, therefore, a synonym of the latter; (6) a representative of the order Solifugae hitherto unknown to Palaeontology has been found in *Protosolpuga carbonaria* n. gen., n. sp.; (7) a new order *Kustarachnae* has been established for the three species of *Kustarachne*.

THE SYSTEM

Although the class of Arachnida has received a good deal of attention from zoologists and palaeontologists, there exists still considerable divergence of opinion as to the essential characters separating this class from the rest of the arthropods. The typical forms such as scorpions and spiders have only 6 pairs of uniramous appendages of which the first pair is praeoral. The segmentation of the legs is also alike in the typical forms and shows the close relation existing between them. This is also true of the Xiphosura and Gigantostraca (Eurypterida) which are now usually placed in the class of Arachnida.

Yet under the influence of parasitism this character becomes more or less obliterated and we find only 4 pairs of appendages in the family Eriophyidae among the Acari. On the other hand Pycnogonida which are often classed as an order of marine Arachnida, show

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a variable number of appendages from 4 pairs in *Pycnogonum littorale* to 8 pairs in *Decalopoda*. The order Tardigrada has also been considered to belong to the class Arachnida, as highly degenerate forms descended from Acari. This view has recently been abandored on good grounds, since the internal organization of these little invertebrates has little in common with either typical or aberrant forms. It has been pointed out by different authors that a complete absence of a meso- and metasoma and the opening of the sexual ducts into the intestinal canal, has no homologon among Arachnida. It is true that the abdomen has almost completely disappeared in the case of Pycnogonids also, and that the sexual ducts in this group also open in a way not similar to that in Arachnida. But the Pycnogonids have, at least, segmented appendages, while the so called feet of the Tardigrada are not segmented. But the absence of segmentation may be due to the loss of it during the phylogenetic development just as it has been lost in the abdomen of true spiders and ticks, where it appears only in the embryonic development. Moreover, the legs of some mites show a considerable tendency in the same direction of reducing the normal number of segments and of obliterating the external signs of segmentation. The order of Pentastomida is also frequently placed in the class of Arachnida. The four chitinous hooks of the adult are homologized with the first and second pair of appendages and derived from the two pairs of appendages of the larval stage. The loss of the remaining four pairs is attributed to the highly specialized parasitism of the Pentastomida. But if these forms have ever developed from typical Arachnida, there is certainly no evidence of their past history left either in the anatomy or the embryology of the now living forms. It may be safer, therefore, to derive both the Tardigrada and the Pentastomida directly from primitive, annulated worms, and to regard them as separate phyla.

In the internal organization of Arachnida there are several structures in common to the majority of them, such as the coxal glands for example, but the influence of parasitism extends to internal characters as well as to external structures and has resulted in a degeneration of many organs. Thus the characteristic organs of respiration are wholly lacking in many mites and in other forms have followed two different courses of development The division of the body into a cephalothorax and an abdomen, also holds good only in the case of typical Arachnida. In the Solifugae we find the cephalothorax not yet completely fused, since the last three segments are free; in the Ricinulei there is a movable plate in front of the first pair of appendages; in the Opiliones the body shows a tendency

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toward a fusion of cephalothorax with abdomen and this is brought to completion in the Acari.

In view of such difficulties in the way of building a system based on comparative anatomy alone, *Ray Lankester* has made the attempt to employ as main character of the class, the true segmentation of the head. We must bear in mind that the *visible* segmentation is not always a correct criterion for the true segmentation and that segments may without difficulty be traced in the internal organization of an animal when all evidence of their existence has been entirely obliterated from the chitinous exoskeleton; but even the internal organization of an adult arachnid may show no evidence of segmentation while the embryological stages leave no doubt of its having once existed.

Lankester divides the Euarthropoda which form his Grade C in the subphylum Arthropoda of the phylum Appendiculata, into 5 classes: Diplopoda, Arachnida, Crustacea, Chilopoda and Hexapoda. He derives them from a "common ancestor resembling a Chaetopod worm, but differing from it in having lost its chaetae and in having a prosthomere[1] in front of the mouth (instead of prostomium only) and a pair of hemignaths (mandibles) on the parapodia of the buccal somite. The structure of the head in Arthropods presents *three* profoundly separated grades of structure dependent upon the number of prosthomeres which have been assimilated by the prae-oral region." His classification is as follows:

Phylum APPENDICULATA
- Sub-phylum I. Rotifera
- ,, II. Chaetopoda
- ,, III. Arthropoda
  - Grade A. Hyparthropoda (Hypothetical forms)
  - ,, B. Protarthropoda
    - Class Onychophora
  - ,, C. Euarthropoda
    - Class 1. Diplopoda (Head monoprosthomerous, deutognathous)
    - ,, 2. Arachnida (Head diprosthomerous, tritognathous)
    - ,, 3. Crustacea, ,, 4. Chilopoda, ,, 5. Hexapoda (Head triprosthomerous, tetartognathous)

[1] Prosthomeres are the segments in front of the mouth opening.

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The second class or Arachnida are characterized by Lankester as follows:

"Head diprosthomerous, tritognathous—that is to say, with two prosthomeres, the first bearing typical eyes, the second a pair of appendages reduced to a single ramus which is in more primitive forms antenniform, in higher forms chelate or retrovert. The ancestral stock was pantognathobasic—i. e. had a gnathobase or jaw process on every parapodium. As many as six pairs of appendages following the mouth may have an enlarged gnathobase actually functional as a jaw or hemignath, but a ramus is well developed on each of these appendages either as a simple walking leg, a palp or a chela. In the more primitive forms the appendage of every post-oral somite has a gnathobase and two rami; in higher specialized forms the gnathobases may be atrophied in every appendage, even in the first post-oral.

"The more primitive forms are anomomeristic; the higher forms nomomeristic, showing typically three groups or tagmata of six somites each.

"The genital apertures are placed on the first somite of the second tagma or mesosoma. Their position is unknown in the more primitive forms. The more primitive forms have branchial respiratory processes developed on a ramus of each of the postoral appendages. In higher specialized forms these branchial processes become first of all limited to five segments of the mesosoma, then sunk beneath the surface as pulmonary organs, and finally atrophied, their place being taken by a well-developed tracheal system.

"A character of great diagnostic value in the more primitive Arachnida is the tendency of the chitinous investment of the tergal surface of the telson to unite during growth with that of the free somites in front of it, so as to form a pygidial shield or posterior carapace, often comprising as many as fifteen somites (Trilobites, Limulus)."

Sub-divisions of the class Arachnida according to Lankester:

Class ARACHNIDA

Grade A. Anomomeristica
  Sub-class Trilobitae
    Orders. Not satisfactorily determined
Grade B. Nomomeristica
  Sub-class I. Pantopoda
    Order 1. Nymphonomorpha
    ,, 2. Ascorhynchomorpha
    ,, 3. Pycnogonomorpha

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Sub-class II. Euarachnida
Grade a. Delobranchia, Lankester (vel Hadropneusta Pocock)
Order 1. Xyphosura
,, 2. Gigantostraca
Grade b. Embolobranchia, Lankester (vel Aeropneustea Pocock)
Section α. Pectinifera
Order 1. Scorpionidea
Sub-order a. Apoxypoda
,, b. Dionychopoda
Section β. Epectinata
Order 2. Pedipalpi
Sub-order a. Uropygi
Tribe 1. Urotricha
,, 2. Tartaridea
Sub-order b. Amblypygi
Order 3. Araneae
Sub-order a. Mesothelae
,, b. Opisthothelae
Tribe 1. Mygalomorphae
,, 2. Arachnomorphae
Order 4. Palpigradi (= Microtelyphonidae)
Order 5. Solifugae (= Mycetophorae)
Order 6. Pseudoscorpiones (= Chelonethi)
Sub-order a. Panctenodactylii
,, b. Hemictenodactylii
Order 8. Opiliones
Sub-order a. Laniatores
,, b. Palpatores
,, c. Anepignathi
Order 9. Rhynchostomi (= Acari)
Sub-order a. Notostigmata
,, b. Cryptostigmata
,, c. Metastigmata
,, d. Prostigmata
,, e. Astigmata
,, f. Vermiformia
,, g. Tetrapoda

This classification does not include some of the extinct orders and involves several assumptions which possess as yet only the value of more or less useful hypotheses. In his article on Arthropoda in the

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eleventh edition of the Encyclopaedia Britannica, Lankester himself writes.

"According to older views the increase in the number of somites in front of the mouth would have been regarded as a case of intercalation by new somite-budding of new prae-oral somites in the series. We are prohibited by a general consideration of metamerism in the Arthropoda from adopting the hypothesis of intercalation of somites. However strange it may seem, we have to suppose that one by one in the course of long, historical evolution somites have passed forwards and the mouth has passed backwards. In fact, we have to suppose that the actual somite which in grades 1 and 2 bore the mandibles lost those mandibles, developed their rami as tactile organs, and came to occupy a position in front of the mouth whilst its previous jaw-bearing function was taken up by the next somite in order, into which the oral aperture had passed. A similar history must have been slowly brought about when this second mandibulate somite in its turn became agnathous and passed in front of the mouth. The mandibular parapodia may be supposed during the successive stages of this history to have had, from the first, well-developed rami (one or two) of a palp-like form, so that the change required when the mouth passed away from them would merely consist in the suppression of the gnathobase. The solid, palpless mandible such as we now see in some Arthropoda is, necessarily, a late specialization. Moreover, it appears probable that the first somite never had its parapodia modified as jaws, but became a prosthomere with tactile appendages before parapodial jaws were developed at all, or rather *pari passu* with their development on the second somite."

In discussing the validity of Lankester's system which unquestionably has much in its favor, we have to subject the following questions to a careful scrutiny: (1) Do we possess any evidence that post-oral somites (opisthomeres) have passed forward and become prosthomeres? (2) What evidence can be brought in support of the assertion that both grades of Lankester's class Arachnida have two prosthomeres, while the Crustaceae, Chilopoda and Hexapoda have three prosthomeres? (3) Is it right to assume that the appendages of the somites which passed in front of the mouth have changed their function as jaws to become tactile organs, or is the second alternative of Lankester's more correct, "that the buccal gnathobasic parapodia (the mandibles) were in each of the three grades of prosthomerism only developed after the recession of the mouth and the addition of one, of two, or of three post-oral somites to the prae-oral region had taken place."? (4) Is the segmentation of the head of fundamental,

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phylogenetic value and does it justify the expansion of the class to include also the Trilobites and Pantopods?

Numerous embryological studies have given an affirmative answer to the first question. It has been shown by *Heymons* that in the Chilognatha, of the three pairs of post-oral embryonic segments designated respectively as prae-antennal, antennal and prae-mandibular, the second develops the antennae of the adult, the first forms transient appendages, while the third disappears altogether at an early stage. The fourth post-oral segment gives rise to the mandibles. In insects we have a somewhat similar condition, the antennae arising from the second post-oral segment while the third segment gives origin to a temporary, embryonic pair of appendages. The protencephalon, on the other hand, representing the first, prae-oral segment, is divided into three lobes, the first of which develops into the optic ganglion while the second and third give rise to the brain proper. In the adult insect the procerebral lobes of the brain give rise to the nerves of the ocelli or simple eyes. The class Crustacea is somewhat different from the two preceding ones. Here it is more or less customary to regard the eyes as modified appendages of the first prae-oral segment and this view has gained some support in the experiments of *Herbst*, which show that in place of an amputated eye under circumstances an antenna may develop. But it is far from being evident that regeneration repeats past history. Double members may be produced artificially in lower vertebrates by splitting the germ of the anterior or posterior leg and it is clear that they do not represent structures which once existed but have been lost. Moreover, the early larva of the lowest crustaceans, the so called Nauplius, has only three pairs of appendages, all of which belong to post-oral somites. Of these appendages the first pair becomes the antennules, the second the antennae and the third remains post-oral and changes into the mandibles. The eyes of higher crustaceans develop later and occupy a position in front of the antennules.

Among the recent Arachnida the spiders have been studied by different investigators and their embryology is better known than that of any other order. It is beyond any doubt that the cheliceral segment appears originally as a post-oral metamerite and occupies later the position in front of the mouth. There is, however, a great divergence of opinion as to whether the eyes represent a separate segment and whether they are homologues to the eyes of crustaceans and insects. In a recent paper on the development of *Ischnocolus*, *Schimkewitsch* writes:

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„Das Nervensystem besteht auf diesem Stadium im Cephalothorax aus Ganglien, welche in ihrem Inneren deutliche, noch nicht verschlossene Höhlen aufweisen, und zwar aus dem unpaaren Nackenganglion und einer Reihe von paarigen Ganglien: zwei Paaren Scheitelganglien, zwei Paaren Augenganglien (das eine für die seitlichen, das andere für die mittleren Augen) dem paarigen Chelicerenganglion, dem paarigen Pedipalpenganglion, vier Paaren Beinganglien und einem paarigen Abdominalganglion; im Hinterleibe dagegen liegen drei Paare einzelner Ganglien und eine hintere gangliöse Masse, welche aus mehreren Ganglien zusammengesetzt ist" (S. 705).

With other words we have one single and five paired ganglia which will make up the brain of the adult spider and furnish the nerves for the prae-oral segments. The single ganglion may be compared to the ganglionic mass in the prostomium of Polychetes but there seems to be no good reason why the paired ganglia should not be considered as forming five segments. Although Schimkewitsch does not mention any ganglion for the rostrum (upper lip) the latter has been considered by *Montgomery* to represent in *Theridium* "a pair of true prae-oral appendages, of which the rostral sacs constitute the coelom and the cerebral ganglia the neuromeres." He based his idea of the segmentation of the head on the number of coelomic sacs and of paired appendages and came therefore to the conclusion that spiders have only two prae-oral segments, the rostral (the first) and the chelicera1 (the second). This conception seems to me to contain an error since the rostrum lies behind and not in front of the chelicera. On examining my own sections through young *Lycosas* and adult *Pholcus* I find that the pair of nerves supplying the rostrum arises *behind* the nerves of the chelicera and represents the last pair of nerves given off by the supraoesophageal ganglionic mass or brain. At present I am, however, unable to state whether these rostral nerves arise merely from the lower lobes of the paired ganglion of the chelicera or have their own pair of ganglia. The neuromeres of the brain are well defined in young spiders, although of course not completely separated as in embryonic stages. Do they represent separate segments? It is hard to say. A typical segment is usually composed of several meroms such as sceletal plates, myomeres, coelomic sacs, neuromeres and a pair of appendages. In different regions of the body any one of these meroms may be entirely eliminated or fused with a corresponding merom of the adjoining metamere and there seems to be no good reason why neuromeres should not be as important as coelomic meroms. We may therefore say that, while it is certain that post-oral somites have occupied a prae-oral position, there is no sufficient evi-

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dence for the assertion that Arachnida and Diplopoda have only two prosthomeres while the Crustacea, insects and Chilopoda have three. It seems to me, on te contrary, that in Arachnida and insects more than three prosthomeres went into the formation of the prae-oral part of the head. The anterior middle eyes of Arachnida correspona both in structure and nerve supply to the simple eyes of insects (ocelli) and did not originally belong to the same segment as the side eyes. In the following tables I give for comparison the segmentation in arthropods according to E. R. Lankester, and of the homologuos organs of the head, as it appears from a comparative study of the development and structure of the brain. I want to state, however, that the second table is only a tentative one and that further research will be necessary before the true segmentation of the head in arthropods may be clearly understood.

TABLE I.

Segmentation of the head in different classes of arthropods according to E. R. Lankester[1]

Segments	Diplopoda	Arachnida	Crustacea	Chilopoda	Hexapoda
1.	Eyes	Eyes	Eyes	Eyes	Eyes
2.	**Antennae**	**Chelicera**	Antennules	Antennae	Antennae
3.	Mandibles	Pedipalpi	**Antennae**	**Intercalary**	**Intercalary**
4.	Maxillulae	1 p. legs	Mandibles	Mandibles	Mandibles
5.	Gnathochilarium	2 p. legs	1 Maxillae	Maxillulae	Maxillulae
6.	Embryonic segment	3 p. legs	2 Maxillae	1 Maxillae	Maxillae
7.	1 p. legs	4 p. legs	1 Maxilliped	2 Maxillae	Lower lip

TABLE II.

Homologous structures in the head of some arthropods according to my own interpretation

Crustacea	Diplopoda	Chilopoda	Hexapoda	Araneae	Limules
				Median ganglion	
				1 p. parietal gangl.	
				2 p. parietal gangl.	
			Ocelli	Median eyes	Median eyes
Eyes	Eyes	Eyes	Comp. eyes	Lateral „	Lateral „
Procerebrum					
Antennules	Antennae	Antennae	Antennae		Olfactory org.
Antennae		Intercalary	Intercalary	Chelicera	Chelicera
Upper lip	Upper lip	Upper lip	Upper lip	Upper lip	Upper lip

[1] This table was not taken from any of Lankester's writings, but composed by me on the basis of his ideas.

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A definite answer to the third question cannot be given at the present state of our knowledge. This much seems to be beyond doubt, that appendages *do* change their function in passing from a post-oral to a prae-oral position. Thus the two anterior pairs of appendages in the Nauplius of lower crustaceans serve as swimming legs, while the homologous appendages in adult Malakostraca are antenniform sense organs. On the other hand the chelicera of arachnids are still usually functioning as mouth parts although in somewhat different way owing to their position in front of the upper lip. They have, however, lost their gnathobase which is still present in the embryological stages.

From the foregoing it does not appear reasonable to use the true segmentation of the head as basis for a classification of arthropods before new embryological data are brought in support. The very fact that the segmentation is of primal importance should caution us against drawing conclusions from insufficient premises. The classification which I give further on, is therefore based on characters ascertainable even from palaeontological specimens although derived mainly from the comparative anatomy of recent forms. As the different systems proposed by various investigators are to be found in the recent monograph of Pocock, I refer the reader who is desirous of becoming acquainted with them, to this monograph. The discussion of Pocock's system will be found in connection with the definition of each separate order.

Phylogenetic Development of the Arachnida.

Little may be said concerning the phylogenetic development of arthropods. That they have developed from chaetopodous segmented worms appears to be the only possible conjecture. But the lines along which they developed are so different and the forms so spezialized that the assumption of a polygenetic origin with diverging and converging development seems to be more probable than that of a gradual branching of a common ancestral stock. By this I mean that the different classes of arthropods must have developed not from one ancestor, but at different times and from different species of chaetopodous worms, and that this may be true even for some orders of the same class.

Until quite recently the origin of the scorpions presented, as it seemed, the least difficulties. The segmentation of their body, the shape and size of the cephalothorax, the number of appendages, the presence of a simple telson, remind so strongly of Eurypterids that their derivation from these aquatic arachnids appeared to be much

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more than a mere hypothesis. One had only to imagine that such eurypterids as *Slimonia acuminata* or *Eusarcus scorpionis* acquired the habit of living in very shallow water and changed gradually into scorpions. The only difficulty in the way of such change seemed to lie in the difference of the respiratory organs of scorpions and Eurypterids. But the ingenious explanation of the origin of lung-books from gill-books through an insinking of the latter first brought forward by Lankester and the subsequent observations of Brauer on the embryos of scorpions tended to obviate even this difficulty. The correctness of this interpretation is so apparent, that Lankester has even ventured to express the hope of finding some day specimens of Silurian scorpions which still led aquatic life and breathed by means of gill-books. The absence of spiracles in the fossil *Palaeophonus*, a negative character on which Lankester builds his hope, may however be due merely to poor preservation. This seems to be the more probable since none of the upper Carboniferous arachnids of North America show the slightest trace of spiracles and yet there cannot be any doubt as to their having led a terrestrial life. For a while I thought that perhaps the eurypterids themselves had already internal gill-books of the lungbook type, with spiracles somewhat similar to those of the scorpion, and connecting the gill cavity with the outside. In that case nothing but a change in function would be required to transform them into the lung-books as we find them in recent scorpions. One could imagine that the insinking took place in aquatic arachnids as a protection against injuries on the one hand and angainst too rapid drying in case of temporary exposure to air on the other hand. I tried to find support for my assumption not in the absence of spiracles in remains of terrestrial arachnids, but in the size and position of the gill-books in Eurypterids. Disregarding the presence of gill-books in the second abdominal somite where in the scorpion they are modified into combs, their size and position in the following four somites correspond almost exactly with the size and position of the lung-books. A mere impression of lamellae on the concretion in the absence of an impression of spiracles could be readily interpreted in either sence. Morever, the overlapping of the gill-plates and still more the presence of narrow bands, of the same width as the overlapping, in specimens with distended abdomen reminded me strongly of the conditions in modern scorpions where the abdominal sclerites are connected with each other by means of soft membrane. However, after some search for an explanation Professor Schuchert was able to convince me that what I was inclined to interpret as overlapping sclerites of the abdominal wall

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were in reality overlapping gill-plates which are slightly longer than each segment and are connected with the body wall at the anterior edge of each segment. At least on the longitudinal section of one specimen of *Eurypterus remipes* one can see on the outside the heavier outline of the gill-plate with the mould of the gill-book and at a little distance from it inward a thin black line representing evidently the body wall. The appearance of this line suggests that the ventral body wall of the mesosoma in eurypterids was not chitinized, but thin and soft. Herein it resembles the ventral body wall of Palaeozoic scorpions, which as I thy to show in the Special Part was most likely thin and soft. But a derivation of they scorion's lung-books from such gill-books as those in *Eurypterus* seems highly improbable. The line of attachment of the gill-plates in *Eurypterus*, as I have mentioned above, is at the anterior edge of the somite, whereas the spiracles of the scorpion are in the posterior half of the segment Before an insinking could have taken place, the gill-plate must have first moved down along the surface of the somite, a condition not known to occur in any of the described eurypterids. Another blow to a theory of the origin of scorpions from eurypterids comes through the beautiful work of Clarke and Ruedemann on the Eurypterida of New York which was published while my present monograph was still in the printing. In this exhaustive study of the rich material obtained from different horizons the authors not only bring together all that was known already about eurypterids, but widen and deepen our knowledge of the group in many respects. Although they seem to be in error when they refuse to homologize the sternum of the scorpion with the metastoma of the eurypterids and the chilaria of *Limulus*, they show conclusively that eurypterids have in some respects more similarities with limuloids than with scorpions. The presence of five pairs of gills, the large operculum of the second abdominal somite, the structure of the eyes, the large carapace and smaller number of segments in embryonic stages are of especial importance. The long prosoma and thin metasoma of scorpion embryos are the most important characters separating them from eurypterids. On the other hand the fusion of abdominal segments even in the oldest limuloid, *Protolimulus eriensis*, from the Devonian and the absence of even partial fusion in eurypterids from the Cambrian to the Permian suggests "that the limulids and eurypterids were probably separate in Precambric time." It is interesting to mention in this connection that according to our authors the eurypterids of New York may be divided into four groups in regard to their mode of life and that the different deposits in which they are found show

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that "while the earlier eurypterids were marine and their climacteric fauna euryhaline; their later habit throughout the Devonic and Carbonic led them finally into the fresh water." The species which is most interesting inasmuch as it shows a close resemblance to scorpions, is *Eusarcus scorpionis* from the Silurian (Bertie waterlime) quarries at Williamsville and Buffalo. Yet it does not seem reasonable to imagine that *Eusarcus* is an ancestor of scorpions, first because of the differences in structure and development mentioned above, and then because of the occurrence in the same waterlime of a true Silurian scorpion, *Proscorpius osborni*, which must have led a marine life. Of the European eurypterids none resembles scorpions more than *Slimonia acuminata*, yet in this case the same objection holds true and true scorpions were there already represented by *Palaeophonus*. There remains then the only alternative that the Xiphosura, Eurypterida and scorpions developed independently and that the great similarity between such forms as *Slimonia*, *Eusarcus* and scorpions is due to convergence, as Thorell has already suggested.

The Haptopoda, Phalangiotarbi, Anthracomarti, Opiliones and Acari show some remarkable similarities in structure and may have had another common ancestor, but no Acari are known to have occured in the Palaeozoic era and there are no connecting links between either of these orders and the trilobites. The pseudoscorpions are not known to occur in the Palaeozoic. They show only external similarity to scorpions and their origin cannot be traced. In the number of abdominal segments and in the arrangement of the coxae they resemble rather the Pedipalpi, but it would be very hazardous to derive them from this group. The Solifugae stand quite isolated. The Pedipalpi and Araneae have much in common both in their external and internal organization, but their origin is as dark as that of the preceding orders.

Great activity in the production of new arachnid forms must have taken place at the end of the Devonian or the beginning of the Lower Carboniferous period, since, the Coal Measures or Pennsylvanian show already the majority of orders in full development. All these forms have undoubtedly the structure of terrestrial arachnids, although it is not impossible that some Anthracomarti and Phalangiotarbi led an aquatic life similar to that of recent hydrachnids among the Acari. *Fritsch* has pointed out that on the bodies of two Bohemian species of *Promygale*, which genus according to *Pocock* is synonymous with *Anthracomartus*, are found parasitical gastropods, *Spiroglyphus*, whereas all other arachnids from the same region are free from them. This argument, however,

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does not seem to me to be convincing. The specimen of *Geralinura gigantea* in the possession of the U. S National Museum shows a lamellibranch in the same concretion, yet there can be no doubt that all species of *Geralinura* were terrestrial arachnids. As Professor Schuchert has pointed out to me, the impression of marine animals on the same concretion with arachnids is probably due to the fact that the dead crèatures were washed from the land into the sea where they became fixed in the mud with the other brackish-water remains. The more or less frequent occurrence of ferns in the same concretion with arachnids is due to the same cause and points to the fact that such species lived in a moist climate. We may further conjecture that it was a hot climate, since the majority of living forms of the same orders are mainly distributed throughout the tropical and sub-tropical zones. It is true that the recent representatives of Pedipalpi and especially of Solifugae are more characteristic of dry regions, many of them being even true desert forms; yet on the one hand, a change in climate may have brought about a change in habits, and on the other, species are known which still prefer wet regions. Thus I have found a Solifugid and amblypygous Pedipalpi under bark of decaying tree trunks on the western coast of Chiapas where the yearly rainfall is very high and the countr rich in tropical rain forests. Some species of scorpions and many Theraphosid spiders are found in quantities in the lowest parts of tropical jungles.

The similarity in structure between extinct forms and recent ones suggests that the food must also have been similar, consisting of land animals belonging to the arthropods, possibly some arthrostracous crustaceans, and more certainly Palaeodictyoptera, Protoblattoidea, and arachnids. The Anthracomarti and Phalangiotarbi must have been preying on very small invertebrates since their mandibles were so weak that no traces of them are left. It is not impossible that some of them were phytophagous. The methods of defense against enemies must also have been similar, since the scorpions show a well-developed poison gland and the mandibles of the Pedipalpi and Araneae were apparently of the same type as those of recent forms. It might be supposed that the poison apparatus developed for the purpose of killing the prey and not for self defense, but the study of living arachnids show that they avoid using their poison for that purpose. I have tried in vain to find among the fossiles studied some evidence in regard to their methods of reproduction. The distended abdomen of some scorpions and Pedipalpi is indicative of their being gravid females.

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Whether the scorpions of the late Palaeozoic were already viviparous or still laying eggs, and whether the male spiders had their copulatory apparatus in the palp as is the case with recent spiders and those from the amber, can be determined only when more favorably preserved material is found.

Comparison of the North American Upper Carboniferous Arachnological Fauna with that of Europe and with the Recent Fauna.

In comparing extinct Arachnida of one fauna with those of another we must remember that the most important generic and specific characters are often missing. To avoid unnecessary repetition I shall give an illustration of the truth of this statement in the case of the scorpions which by virtue of their size and the hardness of their skeleton ought to present the least difficulties. One of the most important not only specific, but generic characters is the arrangement of the granules on the edge of the fingers of the pedipalp. None of the Carboniferous scorpions of Europe and North America shows the slightest sign of these granules. Of course it may be assumed that they did not have such granules, that the granules are of more recent origin. But the similarity in other characters makes such an assumption improbable. The very fact that the pedipalp, bent in its normal position, presents the sides of the fingers, is a sufficient cause to prevent us from seeing the granules and would make it extremely difficult to obtain a mould of them even in large recent forms. A character of great importance in the systematics of recent scorpions is the presence of one or of two spines in the articular membrane at the base of the last joint of the legs. The recent family Scorpionidae has only one such spine, while in the other five families there are at least two spines. This character in recent forms is naturally combined with other characters of importance, such as the shape of the sternum, the structure of the comb and the number of side eyes. Anyone who has had opportunity to study recent scorpions will agree with me that the side eyes are visible only when the light falls on them under a definite angle and cannot be distinguished from round granules accompanying them when the light strikes them under another angle It is nothing strange, then, that our knowledge of the side eyes in Carboniferous scorpions is inaccurate and that this character is not of great use. The sternum and the comb are sometimes very well preserved, but in the great majority of cases the comb is missing. To hope ever to find some of the finer specific characters such as the trichobothria, would be simply childish. What

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is true of the scorpions is true to a still greater extent in some of the other orders. Thus the genera and species of recent spiders are based almost entirely on such characters as will never be found preserved in Carboniferous forms. What value then have the genera and species of that extinct fauna? We may safely say that in the majority of cases the species of Carboniferous arachnids would have the value of genera in a recent fauna. Many genera would be regarded as families and some families as suborders. If therefore, basing our judgment on the preserved characters, we should come to theconclusion that a certain Carboniferous European species is identical with a North American one, we would be judging from insufficient evidence. Fortunately such cases do not exist and the Carboniferous species of North America are clearly distinct from those of Europe.

Of the extinct orders the Haptopoda, represented by a single species *Plesiosiro madeleyi*, are known only from Europe, and the Kustarachnae, represented by three species of a single genus, only from North America. The orders Anthracomarti and Phalangiotarbi, both extinct, are represented in both countries. The order Anthracomarti is much richer in Europe than in North America. Its first family, Anthracomartidae, is represented there by 4 genera with 12 species; of these the genus *Anthracomartus* is represented in Europe by 9 species as against 2 species in North America. It is the only genus of the family so far discovered in North American deposits, and it is interesting to mention that neither of the two species has been found at Mazon Creek, the *A. trilobitus* being a common arachnid from Arkansas in strata somewhat older and *A. triangularis* being represented by a single specimen from the Joggins Mines in Nova Scotia from Leds younger than those of Mazon Creek. The second family, Eophrynidae, is represented in Europe by 13 genera with 16 species, in North America by 3 genera with 4 species. Of these the genera *Areomartus* and *Trigonomartus* are American, while the two species which I have placed under Pocock's genus *Trigonotarbus* may in reality be representatives of a separate genus. Among the Phalangiotarbi the family Heterotarbidae with its single species *Heterotarbus ovatus* is known only from this country. The family Phalangiotarbidae is represented in Europe by a single genus and species, *Phalangiotarbus subovalis*, which does not occur in North America, as against 3 genera with 4 species in this country. The family Architarbidae is represented in North America, by the genera *Opiliotarbus* and *Architarbus*, the first with 1, the second with 3 species. In Europe it is represented by *Architarbus* alone, of which there are known 5 species.

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Turning now our attention to the other orders represented both in the Carboniferous and recent faunas, we must first of all exclude from consideration the few very inadequately known forms of Opiliones. The presence of maxillary lobes in the coxae of recent Opiliones would speak for an old origin of this order, but for some reason it is very poorly represented in the Carboniferous fauna, if indeed the species described under it belongs to it The order Ricinulei is at present entirely confined to Africa and Brazil, but is represented in the Carboniferous of both Europe and North America. The carboniferous genus *Polyochera* belongs apparently to the rcent family Cryptostemmidae. One species is known from Europe and 2 from Mazon Creek. The genus *Curculioides* belongs to the extinct family Holotergidae, which represents a further development inasmuch as the separate tergites are fused into one shield. It is represented by a single species in Europe and 2 species in North America. The order Solifugae is at present represented mainly in tropical and hot countries, but some species occur in the southern United States, going as far north as Kansas, and some in South Russia and southern Europe (Greece, Spain). The only Carboniferous species of this order is from North America. The order Araneae or spiders is, perhaps with the exception of the Acari, the richest among recent Arachnida. Of its three sub-orders, the Arachnomorphae are spread all over the world. The Theraphosae or Mygalomorphae, including all "tarantulas" and trap-door spiders, are preëminently tropical, but some species occur as far north as southern France in Europe and the District of Columbia in this country. The third suborder, or Mesothelae, is almost wholly extinct. Only 2 recent species are known from Pinang and Sumatra. This was the best represented sub-order among the spiders of the Carboniferous period. It was much better represented in Europe than here ; we have only 1 genus with 2 species, whereas 5 genera containing 5 species have been decsribed from Europe and 6 more European species have been probably incorrectly placed under the American genus *Arthrolycosa*. No remains of the Mygalomorphae are known either from Europe or from North America. Of the Arachnomorphae 3 species belonging to as many genera have been described from Europe, but no representatives of this sub-order have been found in North America, although the recent North American spider fauna is richer than the European one. The order Pedipalpi is at present restricted to hot and tropical countries. It is totally absent in Europe, while 1 species of a whip scorpion and 2 species of the sub-order Amblypygi are found in Texas, Florida, Arizona and California. The sub-order Uropygi or whip scorpions are re-

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presented in the North American Carboniferous fauna by the genus *Generalinura* with 3 species. In England it is represented by 1 species, *G. britannica*, and in Bohemia by *G. bohemica*. The real generic characters used in the systematics of recent whip scorpions are not preserved in the Carboniferous specimens, and the American species may in reality belong to a different genus from the European ones. The sub-order Amblypygi is represented in this country by 3 species belonging to as many genera, one of which, namely Graeophonus, has also a representative from England in *G. anglicus*. The order Scorpiones is at present restricted to tropical and hot countries with 2 species, however, living as far north as the Karpathian mountains and southern Germany, and several other species in southern Europe. In the United States occur 22 species of scorpions, two of which go as far north as Colorado, Utah, Nevada and Nebraska. Leaving out of consideration *Mazonia woodiana* from Mazon Creek, a species which may eventually prove to be not a true scorpion, the Carboniferous scorpions may be divided into 3 families, at least one of which, Isobuthidae, is distinct from all recent scorpions and therefore extinct. This family is represented in Europe by 3 species belonging to 2 genera, and by a third with a single species in North America. The family Cyclophthalmidae is represented in Europe by 3 genera with 5 species. A fourth, rather uncertain genus is represented by a single species in North America. The family Eoscorpionidae shows many relations to recent Scorpionidae and Vejovidae and represents probably two or three families thrown together for lack of distinctive characters. The genus *Microlabis* with its single species, *M. sternbergi* is known only from Europe. The genera *Palaeopisthacanthus* with 2 species and *Trigonoscorpio* with a single species are American. Of the genus *Eoscorpius* 4 species occur in Europe and 4 in this country.

While any conjecture as to the direction in which the phylogenetic development of arachnids took place in Europe and North America, would be premature, the following conclusions seem to have sufficient foundation in fact: (1) that the Carboniferous arachnological fauna of North America is distinct from that of Europe and developed along somewhat different lines, and (2) that both faunas have more similarity with recent faunas of tropical countries, than with such of the same locality.

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SPECIAL PART

PHYLUM ARTHROPODA

Invertebrates with a chitinous exoskeleton and usually segmented appendages, with a prae-oral supraoesophageal brain composed of not less than 2 pairs of ganglia, and a ventral chain of ganglia, which shows different grades of concentration. Organs of respiration, when present, in form of gill-books, lung-books, or tracheal tubes. Organs of circulation, when present, never in the form of a closed system, heart open at both ends, with side ostia. Excretory organs either in form of modified nephridia or as malpygian tubes. Development direct or indirect, in the latter case often with a complicated metamorphosis.

The phylum is composed of 10 classes.

Key to the classes of the Phylum Arthropoda.

1. Two pairs of prae-oral appendages (behind the eyes) Crustacea
   + one pair of prae-oral appendages (behind the eyes) . . . 2
2. Legs biramous . . . . . Trilobita
   + legs uniramous 3
3. Segmentation of the body homomeric 4
   + segmentation of the body heteromeric 8
4. Head with 1 pair of post-oral appendages (mandibles) and a pair of papillae. Genital opening on penultimate segment. Legs with 2 claws . . . . . Protracheata
   + head with at least 2 pairs of post-oral appendages. Legs with 1, 2 or 3 claws 5
5. Head with 2 pairs of post-oral appendages. Antennae short, not more than 7-jointed 6
   + head with more than 2 post-oral appendages. Antennae long, with many joints 7
6. Antennae simple. Tracheal spiracles at base of all legs. Genital opening on third somite Diplopoda
   + antennae with 4 basal joints, from the distal of which arise 2 1-jointed branches, the external with 1 bristle, the internal with 2 bristles. Respiratory organs absent. Genital openings at base of 2d pair of legs Pauropoda
7. Three pairs of post-oral appendages in the head. First pair of legs modified as maxillipeds. Tracheal spiracles numerous, never on the head. Genital opening on penultimate segment . . . . . Chilopoda

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+ four pairs of post-oral appendages. No maxillipeds. One pair of tracheal spiracles only, on the head. Genital openings on third somite . . . . . Symphyla

8. Abdomen rudimentary. Genital openings on the 2d joint of legs of the 4th pair, or 3d and 4th, or 2d, 3d and 4th. Number of post-oral appendages 5—7 pairs . . . . Pycnogonida
+ abdomen not rudimentary. Genital opening never on legs 9

9. Head and thorax fused together. Cephalic part with 1 pair of post-oral appendages. Thoracic part with 4 pairs of legs (the last 2 pairs absent in 1 family of Acari) Arachnida
+ head not fused with thorax. Three pairs of post-oral appendages in the head. Thorax with 3 pairs of legs Hexapoda (Insecta)

CLASS ARACHNIDA

Arthropods with at least 3 prae-oral segments, with 1 pair of prae-oral appendages modified as chelicera, with 5 pairs of postoral appendages, the first of which is represented by the pedipalpi. Head fused with at least 1 thoracic segment, usually with entire thorax, forming a cephalothorax. Genital opening on first somite of mesosoma. Nephridia modified as coxal glands. Legs typically with 7, pedipalpi with 6 joints.

This class is composed of 15 orders.

Key to the Orders of Arachnida.

1. Opisthosoma with an unsegmented telson 2
+ Opisthosoma without a telson, sometimes with a segmented whip 4

2. Post-abdominal segments fused. Abdomen with a large genital operculum and 5 gill-books. Legs of the 1st, 2d, and 3d pair chelate . . . . . Xiphosura
+ post-abdominal segments free; legs not chelate 3

3. All post-oral appendages with gnathobases. 5 pairs of gill-books . . . . . Gigantostraca
+ only the anterior 3 pairs of post-oral appendages with gnatho-bases. Pedipalpi chelate. 4 pairs of lung-books Scorpiones

4. In front of the cephalothorax a movable plate (cucullus) Ricinulei

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+ cucullus absent 5

5. All segments of the cephalothorax fused together 7
+ two or three posterior segments of the cephalothorax free. Mandibles always chelate 6

6. Only 2 posterior cephalothoracic segments free. Abdominal segments 11, the last with a segmented whip Palpigradi
+ three cephalothoracic segments free. Abdominal segments 10. No whip . . . . . Solifugae

7. Abdomen with petiolus 8
+ abdomen broadly joined to the cephalothorax 10

8. Coxae of pedipalpi completely fused together, forming a triangular plate. Pedipalpi chelate. Coxae of legs radiating from the central sternum, equal in size. All legs thin and long . . . . . Kustarachnae
+ Coxae of pedipalpi not fused into one plate 9

9 Pedipalpi raptorial; 1st pair of legs transformed into an antenniform sense organ. No spinning organs Pedipalpi
+ Pedipalpi pediform; 1st pair of legs not transformed into an antenniform sense organ. Spinning organs in abdomen . . . . . Araneae

10. Pedipalpi powerful, chelate. Chelicera chelate. Spinning glands in front or behind the genital openings, their ducts opening on movable finger of chelicera Pseudoscorpiones
+ Pedipalpi not chelate. Spinning glands absent 11

11. Abdomen not segmented (with exception of the suborder Notostigmata in which there are 4 dorsal abdominal stigmata). Coxae of all legs devoid of maxillary lobes Acari
+ abdomen clearly segmented 12

12. Coxae of the 1st pair of legs and often also of the 2d and 3d pair with maxillary lobes. Chelicera chelate. Abdomen composed of 10 segments, the 10th being represented by the operculum, but the number of visible tergites and sternites is usually smaller, owing to a fusion of the anterior segments with the cephalothorax Opiliones
+ all coxae without maxillary processes 13

13. Tarsi and metatarsi of 1st pair of legs converted into a 7-jointed tactile organ. Abdomen composed of 11 seg-

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ments, the 11th being represented by the operculum situated on the ventral surface . . . . . Haptopoda
+ first pair of legs pediform, not converted into a tactile organ 14

14. Four, 5 or 6 anterior abdominal tergites very narrow. Dorsal surface of abdomen never divided into longitudinal fields . . . . . Phalangiotarbi
+ anterior abdominal tergites not conspicuously narrow. Dorsal surface of abdomen divided into 3 or 5 longitudinal fields . . . . . Anthracomarti

ORDER SCORPIONES

Head completely fused with thorax. Abdomen twelve-jointed, the last five somites forming the so called cauda or post-abdomen, considerably narrower than the anterior seven. Telson with a poison gland and sting. Chelicera three-jointed, chelate. Pedipalpi six-jointed, chelate, powerful. Coxae of first and second pair of legs with maxillary lobes. Abdominal tergites and sternites heavily chitinized, connected laterally with each other by means af a soft chitinous cuticle capable of considerable distension. Post-abdominal segments without such pleural membranes, their sternites and tergites completely fused in each segment. First sternite represented by the genital opercula, second sternite by the basal joint of the comb. Four pairs of stigmata leading to lungbooks in third to sixth sternites, one pair to each sternite. Anus without operculum, at the end of the twelfth abdominal segment, ventral to the poison gland. Two middle eyes and two to five pairs of side eyes on cephalothorax, some recent species completely blind. All recent scorpions are viviparous.

The classification of recent scorpions is based entirely on external characters, the most important being: the shape of the sternum, the structure of the comb, the position of spines on legs, the shape and sculpture of the pedipalpi, etc. These characters should naturally be of the same importance for the classification of extinct scorpions. Unfortunately it is not always possible to see all important characters in the same Palaeozoic specimen and the knowledge of the group remains therefore incomplete. There are several genera based upon specimens which do not show the most important structures. The position of such genera in the system is naturally not certain. Some species, too, have been placed under genera which they most resemble, i. e., owing to their general resemblance to the type species and not on account of their generic characters which unfortunately have not

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been preserved. Such a method is certainly open to grave criticism, but it is the only possible one. The text figures 1—4 showing the external characters of recent scorpions will help the understanding of the incomplete remains of Palaeozoic specimens.

The scorpions have been divided into two sub-orders, the distinguishing character being the presence or absence of two claws on the walking legs.

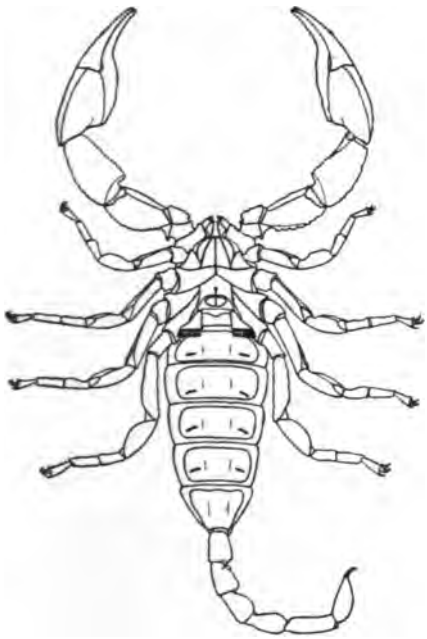

Fig. 1.

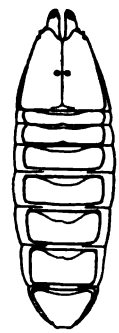

Fig. 2.

Fig. 3.

Fig. 4.

Figure 1.—*Opisthacanthus elatus* (Gerv.), from the West Indies, ventral surface of a gravid female. Figure 2.—Same, dorsal surface of cephalothorax and anterior seven abdominal segments. Figure 3.—*Centrurus junceus* (Herbst), from Cuba, end of tarsus with walking spine, two claws and dorsal lobe. Figure 4.—Same, viewed from below to show the position of the dorsal lobe.

LIST OF DESCRIBED SPECIES OF SCORPIONS

SUB-ORDER APOXYPODA. SILURIAN SCORPIONS

Tarsi terminating in a sharp point, without claws.

Family Palaeophonidae Thorell and Lindström

Genus *Palaeophonus* Th. and L. 1884.

Genotype *P. nuncius* Th. and L.

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1. *P. nuncius* Th. and L., K. Svensk. Vet. Ak. Handl., Vol. 21, No. 9. 1884, pl. I. Pocock, Q. J. M. S., 1902, p. 296. Fritsch, Pal. Arachn., 1904, p. 63, fig. 78.
   From the Silurian (Wenlock) of Gotland.
2. *P. caledonicus* Hunter, Trans. Geol. Soc. Glasgow, Vol. VIII, 1886, p. 169. Id., Ibid., Vol. V, 1887, pp. 185–191. Peach, Nature, Vol. XXXI, 1885, p. 295.
   = *P. hunteri* Pocock, Q. J. M. S., 1902, p. 291, pl. 19. Fritsch, Pal. Arachn., 1904, p. 63, fig. 79.
   P. caledonicus Bather, Ann. Mag. Nat. Hist., (8), Vol. VIII, 1911, p. 676.
   From the Silurian (Ludlow), of Scotland.
3. *P. loudonensis* Laurie, Trans. Roy. Soc. Edinb., Vol. XXXIX, 1889, p. 576, pl. I, fig. 1. Fritsch, Pal. Arachn., 1904, p. 64, fig. 80.
   Found in the Silurian of Scotland.

Genus *Proscorpius* Whitfield 1885.

Genotype and only species *P. osborni* Whitf., Bull. Am. Mus. Nat. Hist., 1885, Vol. I, p. 181, pls. 19 and 20. Clarke and Ruedmann, Eurypterida of New York, 1912, Vol. I, p. 387, ff. 81—83, Vol. II, pl. 88.
From the Silurian (Cayugan series, Bertie formation), Waterville, N. Y.

SUB-ORDER DIONYCHOPODA

Scorpions with two claws at the end of each tarsus.

Pocock in his monograph proposes to divide this sub-order into two groups: Lobosterni "with bilobed, posteriorly laminate sternal plates on the opisthosoma and skeletal plates, whether belonging to the fourth leg or not, on each side of the genital operculum," and Orthosterni, with plates similar to those in recent scorpions. To the first belong the genera *Eobuthus* and *Isobuthus*, to the second *Cyclophthalmus*, *Archaeoctonus*, *Anthracoscorpio*, *Microlabis* and possibly *Palaeomachus*. It seems to me, however, that the two groups of Pocock are artificial inasmuch as the new genus *Palaeobuthus* described below, although agreeing in the character of its sternites with recent scorpions, is closely related to *Eobuthus and Isobuthus* in the structure of the coxae. I propose therefore to divide the palaeozoic Dionychopoda into families without reference to the shape of the abdominal sternites.

Family Isobuthidae.

Late Palaeozoic scorpions in which the coxae of the fourth pair of legs are abutting against the genital opercula. To this family belong

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three genera, *Isobuthus*, *Eobuthus* and *Palaeobuthus*. They may be distinguished as follows:

1. Abdominal sternites with straight posterior edges. Sternum triagonal *Palaeobuthus* n. gen. (see below).
   Genotype *P. distinctus* n. sp., from Mazon Creek.
   + abdominal sternites with posterior edges curved, so that the sternites appear bilobed 2
2. Sternum rhomboidal . . . . . Genus *Isobuthus* Fritsch 1904
   Genotype and only species *I. kralupensis* Th. and L., Kongl. Svensk. Akad., Vol. 21, No. 9, 1884, p. 17. Fritsch, Pal. Arachn., 1904, p. 70, fig. 88; pl. 10, figs. 1—11.
   Found in the Coal Measure of Kralup, Bohemia.
   + sternum oval . . . . . Genus *Eobuthus* Fritsch 1904
   Genotype *E. rakovnicensis* Fritsch.
   Described species:
   1. *E. rakovnicensis* Fritsch (ad partem), Pal. Arachn., 1904, p. 74, figs. 90, 92; pl. 8, figs. 1, 2. Pocock, Carb. Arachn., 1911, p. 13.
      Found in the Coal Measures (Noegerathienschiefer) of Rakonitz, Bohemia.
   2. *E. holti* Pocock, Carb. Arachn., 1911, p. 14, fig. 1; pl. II, fig. 2.
      From the Coal Measures of England.

Family Cyclophthalmidae.

Late Palaeozoic scorpions with normal arrangement of coxae, middle eyes not close to the anterior edge of the cephalothorax, hand comparatively wide with short fingers and sternum "pear"-shaped.

This family contains three genera from Europe and one from North America.

Genus *Cyclophthalmus* Corda 1835.

Genotype *C. senior* Corda.

1. *C. senior* Corda, Verh. Ges. vaterl. Mus. Böhmen, 1835, p. 36. Fritsch, Pal. Arachn., 1904, p. 66, figs. 84—86; pl. 7, figs. 1—4; pl. 8, figs. 3—5.
   From the "Steinkohlensandstein" of Bohemia.
2. *C. euglyptus* (Peach)
   = *Eoscorpius euglyptus* Peach, Trans. Roy. Soc. Edinb., Vol. XXX 1883, p. 402, pl. XXII.
   C. euglyptus Pocock, Carb. Arachn., 1911, p. 19, fig. 4.
   From the Lower Carboniferous (Cementstone) of Scotland.

Genus *Palaeomachus* Pocock 1911.

Genotype and only species *P. anglicus* (Woodward).

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= *Eoscorpius anglicus* Woodward, Quart. Jour. Geol. Soc., Vol. XXXII, 1876, p. 58, pl. VIII, fig. 3.

P. anglicus Pocock, Carb. Arachn., 1911, p. 16, fig. 2.

Bather, Ann. Mag. Nat. Hist., (8), Vol. VIII, 1911, p. 673, with fig.

From the Coal Measures of England.

Genus *Archaeoctonus* Pocock 1911.

Genotype *A. glaber* (Peach).

1. *A. glaber* (Peach).

= *Eoscorpius glaber* Peach (ad partim), Trans. Roy. Soc. Edinb., Vol. XXX, 1883, pp. 398–400, pl. XXII, figs. 2–2l.

A. glaber Pocock, Carb. Arachn., 1911, p. 17, fig. 3.

From the Lower Carboniferous of Scotland.

2. *A. tuberculatus* (Peach).

= *Eoscorpius tuberculatus* Peach, Trans. Roy. Soc. Edinb., Vol. XXX, 1883, p. 398, pl. XXIII, figs. 8–8h.

A. tuberculatus Pocock, Carb. Arachn., 1911, p. 19.

From the Lower Carboniferous (Coal Measures, Calciferous) of Scotland.

Eoctonus n. gen.

Genotype *E. miniatus* n. sp.

From the Pennsylvanic (Lower Allegheny) of North America.

Family Eoscorpionidae.

Late Palaeozoic scorpions with normal arrangement of coxae, middle eyes not close to the anterior edge of cephalothorax, hand comparatively narrow with long fingers; pentagonal sternum.

The family contains four genera.

Genus *Eoscorpius* Meek and Worthen 1868.

Cephalothorax more or less rectangular, cauda normal.

Genotype *E. carbonarius* M. and W.

1. *E. carbonarius* M. and W., Amer. Jour. Sci. & Arts, (2), 1868, Vol. XLV, p. 25. Id., Geol. Surv. Ill., Vol. III, 1868, p. 560 with fig.

From the Pennsylvanic (Lower Allegheny) of North America.

2. *E. sparthensis* Baldwin and Sutcliffe, Quart. Jour. Geol. Soc., Vol. LX, 1904, p. 396, fig. 2.

= *Eubuthus rakovnicensis* Fritsch (ad partem British specimen), Pal. Arachn., 1904, p. 74, fig. 91, pl. 12, figs. 1–3.

= *Anthracoscorpio sparthensis* Pocock, Carb. Arachn., 1911, p. 20.

From the Coal Measures of England and Bohemia.

3. *E. dunlopi* (Pocock).

= *Anthracoscorpio dunlopi* Pocock, Carb. Arachn., 1911, p. 21, fig. 5, pl. I, fig. 1.

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From the Upper Coal Measures of Scotland.

4. *E. buthiformis* (Pocock).
   = *Anthracoscorpio buthiformis* Pocock, Carb. Arachn., 1911, p. 24, figs. 6–8; pl. I, fig. 2; pl. II, fig. 1.
   From the Coal Measures of England.
5. (?) *E. ornatus* (Fritsch).
   = *Feistmantelia ornata* Fritsch, Pal. Arachn., 1904, p. 75, pl. XI, fig. 1–5.
   From the Middle Permian (Lebach) of Bohemia.
6. *E. typicus* n. sp.
   From the Pennsylvanic (Lower Allegheny) of North America.
7. *E. danielsi* n. sp.
   From the Pennsylvanic (Lower Allegheny) of North America.
8. *E. granulosus* n. sp.
   From the Pennsylvanic (Lower Allegheny) of North America.

Genus *Trigonoscorpio* n. gen.

Cephalothorax triangular, cauda rather weak.
Genotype and only species *T. americanus* n. sp.
From the Pennsylvanic (Lower Allegheny) of North America.

Palaeopisthacanthus n. gen.

Cephalothorax trapezoidal, cauda very small.
Genotype *P. schucherti* n. sp.

1. *P. schucherti* n. sp.
   From the Pennsylvanic (Lower Allegheny) of North America.
2. *P. mazonensis* n. sp.
   From the Pennsylvanic (Lower Allegheny) of North America.

Genus *Microlabis* Corda 1839.

Cephalothorax trapezoidal, cauda not known, hand very weak.
Genotype and only species *M. sternbergii* Corda, Verh. böhm. Ges. vaterl. Mus., 1839, pp. 14–18, pl. I. Fritsch, Pal. Arachn., 1904, p. 69, fig. 87, pl. 9, figs. 1–4.

Family Mazoniidae.

Middle eyes close to anterior edge of cephalothorax. Structure of pedipalpi and sternum not known.

Genus *Mazonia* Meek and Worthen 1868.

With the characters of the family.
Genotype and only species *M. woodiana* M. and W., Geol. Surv. Ill., Vol. III, 1868, p. 563, with figs.
From the Pennsylvanic (Lower Allegheny) of North America.

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KEY TO GENERA OF NORTH AMERICAN CARBONIFEROUS SCORPIONS

1. Seventh abdominal tergite similar to the preceding ones, 8th similar to the 7th of recent scorpions.

Mazonia

\+ seventh abdominal tergite as in recent scorpions. Post-abdomen with 5 segments 2

2. Coxae of 3d pair of legs abutting against the sternum, those of 4th pair against the genital opercula.

Palaeobuthus

\+ coxae of 3d and 4th pair of legs abutting against the sternum (coxae of *Trigonoscorpio* and *Eoctonus* not known but presumably of this type) 3

3. Cephalothorax triangular; anterior border more than 4 times narrower than the posterior one.

Trigonoscorpio

\+ cephalothorax never as narrow in front 4

4. Post-abdomen very short and slim.

Palaeopisthacanthus

\+ post-abdomen normal 5

5. Hand short and wide, with short fingers.

Eoctonus

\+ hand narrow, fingers very long.

Eoscorpius

DESCRIPTION OF NORTH AMERICAN PALAEOZOIC SCORPIONS

Family Eoscorpionidae.

Genus *Eoscorpius* Meek and Worthen.

New definition. Sternum pentagonal. Cephalothorax with more or less parallel sides, never conspicuously narrowed in front. Middle eyes either removed from the anterior edge of the cephalothorax at least $^1/_3$ its length, or if placed close to it then the edge itself straight. Cauda normal. Hand narrow with very long fingers.

The type species, *E. carbonarius*, resembles very closely the European *E. dunlopi* (Pocock) and *E. sparthensis* Baldwin and Sutcliffe, but is considerably smaller. Pocock rejects the genus *Eoscorpius* in favor of *Anthracoscorpio* since the characters of the former are not sufficiently known. A comparison of the type with *E. typicus* and *E. danielsi* shows, however, that these species are very closely related to the type species, although sufficiently distinct not to be placed under the same species. In fact, *E. typicus* could have been regarded

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as a small variety of *E. carbonarius* if there were more gradations between the two. As it is, both types being probably gravid females, I thought it wiser to regard *E. typicus* as specifically distinct from *E. carbonarius*. It may be objected that since the additional characters of the genus are derived from new species, the genus *Anthracoscorpio* should have precedence. But the characters of the latter genus are also based on a defective specimen and were supplemented later when new species were found. Besides, if we were to accept Pocock's definition of *Anthracoscorpio*, then *Eoscorpius typicus* would certainly have to be placed under that genus and with it *E. carbonarius*, on account of its extreme similarity. The name *Eoscorpius* has priority and should therefore not be changed.

The Palaeozoic scorpions of the genus *Eoscorpius* resemble most some of the recent Vejovis.

Key to North American Species of Eoscorpius.

1. Cephalothorax as long as wide, or longer than wide. Eyes removed from anterior edge 2
   + cephalothorax wider than long. Eyes closer to anterior edge 3
2. Sixth abdominal tergite wider than 1st. Size about 90 mm. *E. carbonarius*
   + first abdominal tergite wider than 6th. Size from 45 to 65 mm. *E. typicus*
3. Abdominal tergites smooth. *E. danielsi*
   + abdominal tergites with a transverse row of punctuated depressions along their posterior border. *E. granulosus*

Eoscorpius carbonarius Meek and Worthen.
Plate II, figure 6.

E. carbonarius Meek and Worthen, Amer. Jour. Sci. & Arts (2), Vol. XLV, 1868, p. 25. Geol. Surv. Ill., Vol. III, 1868, p. 560 with fig.

The obverse of the type specimen in the Museum of the University of Chicago, the reverse in the University of Illinois collection.

Careful examination of both halves of this important fossil convinced me that the description of Meek and Worthen is quite correct and that nothing of importance could be added to it. I therefore quote it here with such abbreviations as seem to be advisable and with the substitution of metric measurements for inches.

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"The only specimen of this fossil yet known to us consists of a cast and mould as revealed in splitting open a concretion. It shows most of the cephalothorax and mandibles in somewhat crushed condition, the dorsal side of the seven abdominal segments, and three of those of the tail, all in place. Also four of the legs on one side and one on the other, with one of the peculiar comb-like organs, . . . the latter being detached and lying in the matrix near the side of the abdomen.

"The cephalothorax seems to be subquadrangular in form, somewhat wider behind than long, the breadth being about 11.5 mm. Unfortunately it is not in a condition to show the ocelli, nor can we see whether or not its anterior edge is emarginate. It shows a minute marginal line behind, from near which there originates a distinct mesial furrow, which extends forward to near the middle, where it is intersected by, or rather bifurcates into, two oblique furrows, with the prominence for the mesial ocelli between them. Two other rather deep lateral furrows extend, one on each side, from the posterior end of the mesial one, obliquely outward, near the posterior margin. The surface is ornamented with irregular scattering granules, mostly upon the prominences between the furrows. The mandibles are stout, . . . but appear to be without teeth or serrations. The movable finger is curved and sharp at the point. The legs are rather stout, with most of the divisions long. Palpi unknown.

"The abdomen is a little more than twice the apparent length of the cephalothorax, or about 23.0 mm. in length, and 15.2 mm. in breadth. Its segments gradually increase in their antero-posterior diameter, from the front one backward to the seventh, which is about twice and a half as long as the sixth or largest of the others (being 9.0 mm. long, and 12.3 mm. wide), subtrigonal in form, with the posterior angle broadly truncated for the attachment of the tail, and the anterior lateral angles a little rounded. The six shorter abdominal segments, especially the anterior ones, have their front margin more or less sinuous along the middle, and their lateral extremities more or less rounded. They all have the surface a little granular, the granules being very small and arranged mainly along the posterior margin. The last, or subtrigonal one, also has on its posterior half, near the middle, two longitudinal, parallel rows of minute pits or punctures.

"Of the tail, only the anterior three segments are preserved in the specimen. These show that it was rather stout, but as distinct from the abdomen by its sudden contraction in breadth, and in the form of its segments, as in the existing Scorpions. Its segments measure as follows: first one, 6.5 mm. in length ,6.0 mm. in breadth; second,

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8.2 mm. in length, 5.5 mm. in breadth; third, 9.5 mm. in length, 4.5 mm. in breadth. They are all oblong in form, more or less nearly rectangular at their ends, and, as near as can be determined from a flattened specimen, apparently provided above with three or more longitudinal rows of granules, and some scattering ones.

"The single detached comb-like organ, seen lying in the matrix on the left side of the abdomen, shows some eleven or twelve of the little laminae or divisions, but apparently had more, as it is incomplete, at least at one end."

It is unfortunate that both the cast and the mould show the dorsal surface of the scorpion. In consequence nothing is known of the shape of the sternum. The total size can also be only guessed and is probably about 90 mm. The specimen was found by Mr. M. Prendel on Mazon Creek, Illinois, in Pennsylvanic (Lower Allegheny) strata.

Eoscorpius typicus n. sp.

Plate I, figures 1–4; text figures 5–7.

This species is represented by four specimens. Two of these, Nos. 37986 and 37987, are in the U. S. National Museum, and two, Nos. 126 and 127 in the Peabody Museum of Yale University No. 37986 of the U. S. National Museum I chose for the holotype.

The obverse of the nodule containing the type specimen (Pl. I, fig. 2) shows clearly the mandibles, cephalothorax, abdomen, first three segments of the post-abdomen and parts of the right palpus and legs. The reverse (Pl. I, fig. 3) shows the complete right palpus, all coxae, sternum, genital opercula, abdomen and four segments of the post-abdomen; also parts of the legs, as represented in text figure 6. The cephalothorax is almost rectangular in shape, 5.5 mm. long, 5.5 mm. wide at posterior edge. Its posterior edge is quite straight, the anterior one almost straight, with a scarcely perceptible emargination. The antero-lateral angles are rounded and the lateral edges distinctly emarginated. Two curved ridges run from the anterior edge, uniting behind the eyes approximately in the middle of the cephalothorax, whence a median ridge proceeds almost to the posterior edge, forming here a small triangular field. A pair of curved ridges run from the middle of the lateral edges obliquely toward the posterior edge where they, too, join the triangular field. The median eyes have apparently the shape of segment of a circle, but it is probable that the segment represents only the socket and that the lens itself was round or oval. No trace of side eyes could be detected, although the edges of the cephalothorax are very distinct.

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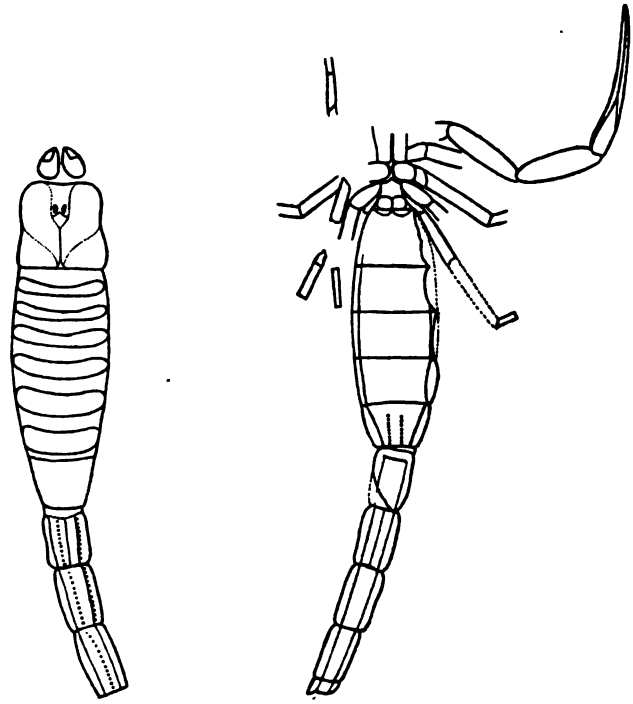

Fig. 5. Fig. 6.

Figure 5.—*Eoscorpius typicus* n. sp., holotype, U. S. N. A. No. 37986, dorsal surface.—Figure 6.—Same, ventral surface. × $\frac{2}{1}$

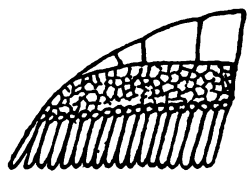

Fig. 7.

Fig. 7. *Eoscorpius typicus* n. sp., U. S. N. M. No. 37987, comb. × $\frac{8}{1}$

The abdomen is 16 mm. long. The tergites are separated from each other by a considerable space which must have been occupied by the soft chitinous membrane the outlines of which are clearly visible on each side; this speaks in favorof the assumption that the type specimen was a gravid female. The third and fourth tergites are the widest, the width of the abdomen being in this region 6.4 mm. The length of the tergites increases gradually from the first backward, the seventh being the longest. It is wider than long, with a slightly procurved anterior edge and sharp angles. All abdominal tergites are with smooth surface. The first post-abdominal or caudal segment is shorter and wider than the second. It has three longitudinal ridges and two rows of

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small, round depressions which evidently are the moulds of what have been granules. The second has two longitudinal ridges and two rows of depressions; the third two ridges and one row of depressions. The genital opercula, representing the first abdominal sternite, are round. The basal plates of the comb, representing the second sternite, have the shape of segments of a circle with the curve directed posteriorly. The next or third sternite (usually called the first) is the longest. The lines between the sternites 3, 4 and 5 are straight, while the anterior edge of the seventh sternite is slightly recurved. Superimposed over the sternites are visible the tergites. There are two parallel rows of round depressions extending over the posterior three-fourths of the seventh sternite. The ventral surface of the caudal segments shows two longitudinal sulci, to which is added in the first caudal segment a transverse row of depressions and in the third a median longitudinal sulcus.

It may seem strange that the abdominal sternites are not separated from each other like the tergites. One would naturally expect that to be so, since this is the rule in recent scorpions. Two explanations may be given to the fact, that the sternites of extinct scorpions are not separated from each other by intersternal membranes. Either the sternites were so long that they overlapped each other under normal conditions in non-gravid females, or the ventral surface of the abdominal segments was soft without hardened plates representing sternites. In the first case we should expect to see double lines separating each segment and that being so, that the anterior line would represent the anterior edge of the posterior segment, while the posterior line, the posterior edge of the anterior segment. I do not know American Palaeozoic scorpions which would show such double lines and assume therefore that the ventral surface of the third to sixth abdominal segments was soft. It is different in the case of the seventh segment. This segment had evidently a strongly chitinized sternite as evidenced by the presence of depressions, The pleura may be seen on each side of the abdomen on the ventral surface of the specimen superimpressed over the segments of the abdomen.

The sternum is pentagonal. The mandibles, preserved only on the obverse of the nodule, are egg-shaped, chelate; their basal joint is lost. The coxa of the palpus is not visible, and of the trochanter only the distal end is preserved. Femur is 5.5 mm. long, patella 5.5 mm. long and scarcely wider than the femur, tibia with finger 7.0 mm. long. The movable finger (the tarso-metatarsus) is almost twice as long as the hand, if both are measured in the line of contact of the two fingers.

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The coxae of the first pair of legs meet in the middle line where they apparently form maxillary lobes, the anterior ends of which are, however, not preserved. The second coxae are short, wide and almost contiguous. If they ever had maxillary lobes they certainly are not preserved. The third coxae are longer and thinner than the second and separated from each other by the full width of the sternum against which they are abutting. The fourth coxae are the weakest of all. They are also abutting against the sternum.

Of the legs are preserved only more or less incomplete joints. The femur of the second leg is 5.0 mm. long The chitin which was preserved in many places has a uniform brown color. The comb is not preserved The total size was probably about 45 mm.

The nodule No. 37987 of the U. S. National Museum (Pl. I, fig. 4) is broken in three pieces and the specimen itself is not complete. The specimen must have been considerably larger, since the abdomen is 26 mm. long and the two post-abdominal segments (the only ones preserved) 14.5 mm. But the general appearance ot the specimen, the shape of the tergites, especially of the seventh, leave no doubt that it belongs to the same species. Neither sternum, nor coxae are preserved and the palpi are also missing. But the interest of the specimen lies in the comb of one side, which is extraordinarily well preserved on both obverse and reverse of the specimen (fig. 7). It is very high at the base. The space between the supporting plates and the teeth is occupied by apparently one long and broad, granulated plate and a row of bead-like small plates. The number of teeth is eighteen. Parts of the comb and of the abdomen were still covered with chitin of the same color as in the preceding specimen.

Specimen No. 126 of the Peabody Museum (Pl. I, fig. 1) belongs to the same species. Only the reverse, however, is preserved, and the ventral surface alone is visible. The palp, sternum, fourth coxae, genital plates, basal plates of the comb, the abdominal sternites, and the first post-abdominal segment, the only one preserved, have the same structure as the type specimen. Of the remaining coxae only parts are visible on the left side of the nodule, and the first, second and third trochanters on the right. Comb and mandibles not preserved.

Length of pedipalp: femur 7.0 mm., patella 9.6 mm., tibia with finger 12.5 mm.

Specimen No. 127 of the Peabody Museum belongs also to this species. The probable length of the specimen is 60—65 mm. The specimen is badly depressed, the cephalothorax scarcely recognizable. Length of abdomen from cephalothorax to first post-abdominal

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segment, 21.0 mm. Length of the four preserved post-abdominal segments, 23.0 mm.

Length of pedipalp: femur, 6,3 mm., patella, 6.3 mm., tibia with finger 11.7 mm.

All four specimens are from the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Eoscorpius danielsi n. sp.

Plate IV, fig. 16; text fig. 8.

The reverse of the nodule containing the type specimen is not in existence. The obverse is in the collection of Mr. L. E. Daniels.

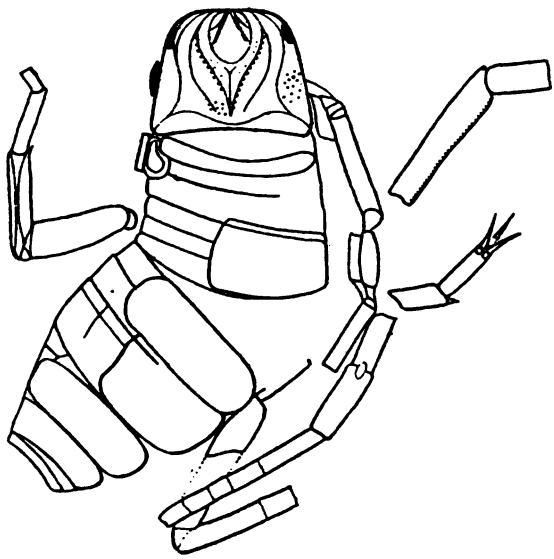

Fig. 8.

Figure 8.—*Eoscorpius danielsi* n. sp., holotype, Daniels coll. $\times \frac{1.5}{1}$

It is a badly deformed specimen without palpi and cauda and with the legs torn from the body and intercrossing each other to such an extent that it is impossible to decide to which each remnant belongs.

The cephalothorax is preserved better than the rest, and is 11 mm. long and 14 mm. wide at the posterior edge, which is slightly recurved. Anteriorly the cephalothorax is somewhat narrower, the width in the region of the alveolate areas being 10 mm. The anterior and the side edges are straight, the angles rounded. A curved ridge runs on each side close to the alveolate region, from the anterior edge backward, gradually becoming lower and changing into a shallow sulcus,

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then turning more outward and rising again in shape of a low ridge which joins the curved transverse ridge in the posterior end of the cephalothorax. The surface carrying the alveolated area on each side is more or less horizontal, but the surface inward from the lateral curved ridges has a steep declivity toward the curved grooves which begin on the sides of the ocular depression and meet in the median line close to the transverse curved ridge. These grooves are outwardly accompanied by a row of small, round depressions. A heavy ridge runs in the median line, gradually rising anteriorly and is highest at the place where it forms a small fork. Immediately in front of this fork lies the oval depression which represents evidently the mould of the eye tubercle. It is very large, reaching anteriorly the edge of the cephalothorax. Within the depression one may recognize a triangular ridge and two pairs of oval depressions (one pair on each side of the triangular ridge). These oval depressions look very much like moulds of eyes. It is possible, however, that only the anterior pair represents eyes, while the posterior pair is a mould of what may have been chitinous granules.

The number of abdominal tergites cannot be counted owing to the presence of transverse lines which represent probably artificial folding of the skin. Moreover they are visible only on the left side of the specimen, the right side being covered by wide plates which I interpret as sternites. A proof of this interpretation I see in the fact that the left side representing the tergites is concave, as in the cephalothorax, while the plates on the right side are convex. All abdominal plates are smooth. On the left side of the abdomen is visible a part of a leg, four segments of which are complete. The femur is 9 mm. long, the tibia 9 mm. and the metatarsus 6 mm. The legs on the right side of the specimen represent a hopeless tangle. One of them, however, is of extraordinary interest since it shows the structure of the two last segments. We note one spine which was probably in the articular membrane of the proximal tarsal joint. The distal joint shows the impression of its ventral surface. One may clearly distinguish a tubercle representing the walking spine, two long claws, a median long, pointed dorsal lobe and two round depressions behind the tubercle. Another fragment of a leg, lying in front of the one just mentioned and probably representing a tibia, shows a row of punctuated depressions along its inner edge. On the left side of the cephalothorax is a long lens-shaped body, probably the transverse section of a leg. Immediately behind the posterior left corner of the cephalothorax is a bean-shaped depression, perhaps also a transverse section of a leg.

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The abdomen is torn in the middle, as shown in the text figure and on the photograph. If straightened out, it would measure about 35 mm.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Eoscorpius granulosus n. sp.

Plates II, fig. 10; III, figs. 11, 12; text fig. 9.

This species is represented by three specimens in the possession of the Peabody Museum, labelled respectively as Nos. 128, 129 and 130. I designate No. 128 as the holo type, it being the best preserved. Only the obverse of the nodule containing the type specimen is in existence (Pl. II, fig. 10; text fig. 9). It shows the cephalothorax with the median eyes, abdomen, three and a quarter segments of the post-abdomen, mandibles, left pedipalp anf fragments of right pedipalp and of two legs, one on each side of the body.

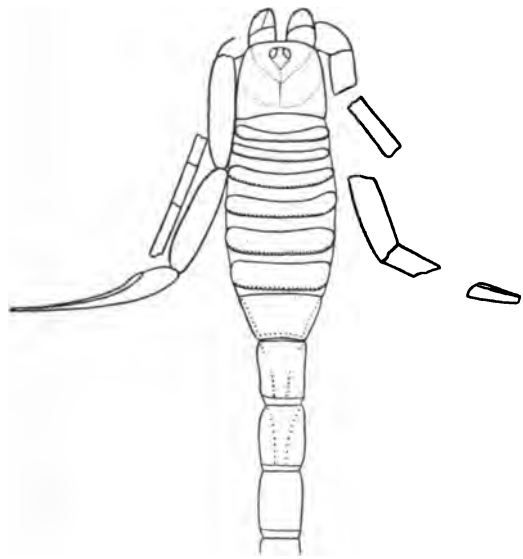

Fig. 9.

Figure 9.—*Eoscorpius granulosus* n. sp., holotype, Peabody Mus. No. 128. Nat. size.

The cephalothorax is somewhat like that of the preceding species. It is 9.5 mm. long and 12 mm. wide at posterior edge which is slightly recurved. The oval eyes are almost their diameter from the anterior edge. A median ridge runs from the edge of the semicircular declivity anteriorly, dividing almost in the middle of the cephalothorax and surrounding the depression representing the mould of the eye tubercle. The anterior angles of the cephalothorax are quite rounded, while the posterior ones are scarcely blunted. The abdomen is 30 mm. long, the tergites considerably separated from each other showing that the specimen was a gravid female. The length of the tergites increases gradually backward, so that the first is the shortest and the seventh

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the longest tergite. Along the posterior edge of each tergite and on the sides of the seventh tergite runs a row of small, round punctuated depressions. The combined length of the three post-abdominal segments is 27 mm. Two rows of punctuated depressions, representing the dorsal crests, are visible on the first and second post-abdominal segments. The pedipalp is long and slender, hand with very long fingers; length of femur 15 mm., patella 15 mm., tibia with finger 23.0 mm. Length of movable finger 17.5 mm.

Specimen No. 130, showing also the dorsal side alone, is somewhat smaller; the cephalothorax measures 7.8 mm. in length and 11.0 mm. in width. It is badly deformed. Only six abdominal tergites are preserved. The right pedipalp is complete and the length of its joints is as follows: femur 7.5 mm., patella 6.4 mm., tibia with finger 13.5 mm. A few severed joints of three right and two left legs are preserved, but it is not possible to identify them. It may be that the specimen is a male or represents a different species, since the relative length of the palpal joints is difierent from that of the type specimen. But the general appearance is much as in the type specimen and the preservation not sufficient to make of this specimen a different species.

Specimen No. 129 (Pl. III, figs. 11, 12). The nodule containing this specimen consists both of the obverse and the reverse, but the latter is badly deformed. The obverse shows the cephalothorax with the eyes, abdomen and one post-abdominal segment, mandibles and parts of femora and tibiae of the legs. One complete pedipalp is preserved on the reverse. The structure of the cephalothorax which is 6.7 mm. long and 8.0 wide, is the same as in the type specimen. The abdominal tergites increase gradually in length and have the same sculpture as the type specimen. On the other hand the pedipalp is more like that in specimen No. 130. The length of its segments is as follows: femur 12.3 mm., patella 9.4 mm., tibia with finger 14.3 mm.; length or movable finger 9.2 mm.; length of abdomen 18.0 mm. Unlike the two preceding specimens the rock in which this specimen is imbedded shows no signs of decomposition and is exceedingly hard.

All three specimens are from the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Trigonoscorpio n. gen.

This genus is characterized by the triangular shape of the cephalothorax, comparatively thin and short tail the last segment of which is $3^3/_4$ as long as wide, and by the hand with long fingers. The state

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of preservation of the only existing specimen makes it impossible to recognize the shape of the sternum or the position of the coxae. Genotype *T. americanus* n. sp.

Trigonoscorpio americanus n. sp.

Plate IV, figs. 17, 18; text fig. 10.

The nodule containing the type specimen consists of two parts, but both show the same structure, so that we have before us a cast and mould of the dorsal surface. The cephalothorax has an almost triangular shape, being 5 mm. wide at the posterior edge and only 1.17 mm. at the anterior edge. Its length in the middle line is 4.8 mm. Its shape is best understood from the text figure 10. The eye tubercle is close to the anterior edge and carries two oval eyes. Two sulci run from the sides of the eye tubercle backward uniting in a transverse sulcus. Another shallow sulcus runs transversely close to the posterior edge. The abdomen is 11.5 mm. long. The first tergite is the longest and the seventh the shortest, being almost completely fused with the sixth. The post-abdomen is comparatively short and slim. Its fourth segment is $2^3/_4$, and its fifth $3^3/_4$ times as long as wide. The whole body is very flat and smooth. The right pedipalp is complete but for the middle of the femur the ends of which are, however, well outlined. The femur is 5.7 mm. long, patella 2.9 mm., tibia with finger 6.0 mm. Both mandibles are well preserved. Of the legs one can see three pairs on the right and four on the left, but none of them is complete. The complete length of this specimen, which is in the collection of Mr. L. E. Daniels of La Porte, Indiana, is about 25 mm. It was found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

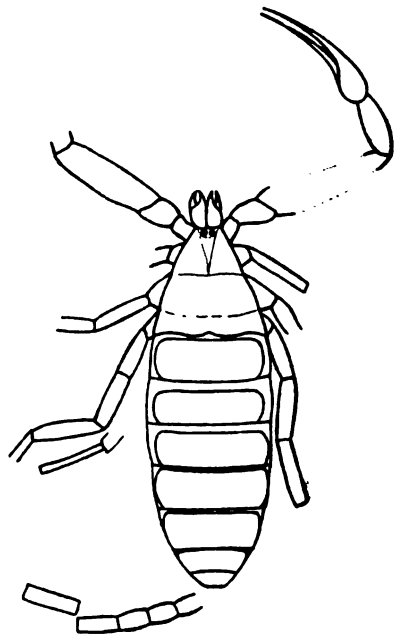

Fig. 10.

Figure 10. — *Trigonoscorpio americanus* n. sp., holotype, Daniels coll., dorsal surface. $\times \frac{3}{1}$

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Palaeopisthacanthus n. gen.

Sternum pentagonal. Hand with long fingers. Post-abdomen very short and slender. Genotype *P. schucherti* n. sp.

Key to the Species of *Palaeopisthacanthus.*

Cephalothorax widest a little in front of posterior edge, and here wider than long.

P. schucherti n. sp.

\+ cephalothorax widest at posterior edge, slightly longer than wide

P. mazonensis n. sp.

Palaeopisthacanthus schucherti n. sp.

Plate II, figs. 8, 9; text figs. 11, 12.

The type specimen, the only one of the species in existence, is in the collection of the Peabody Museum under the number 140.

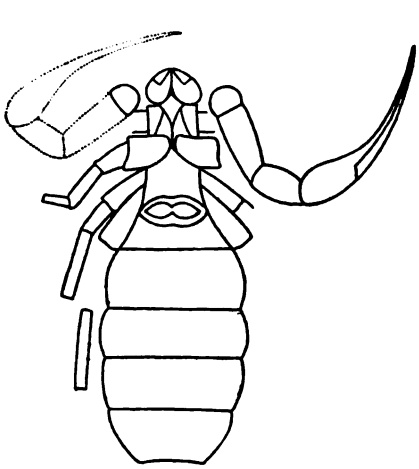

Fig. 11.

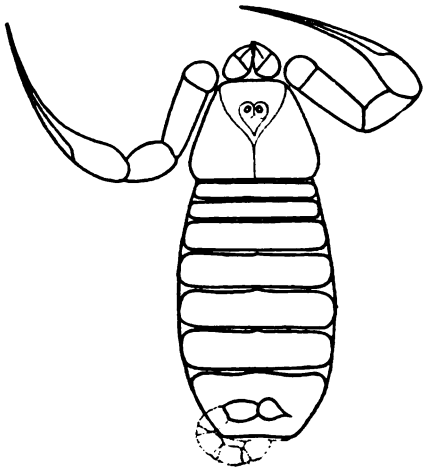

Fig. 12.

Figure 11.—*Palaeopisthacanthus schucherti* n. sp., holotype, Peabody Mus. No. 140, ventral surface. Figure 12.—Same, dorsal surface. × $\frac{4}{1}$

It is an excellently preserved specimen, showing both the obverse and reverse with great detail. The obverse shows both mandibles and palpi, the cephalothorax with the median eyes, the abdomen, the fifth post-abdominal segment with poison gland and fragments of legs to the left of the body; the reverse, both mandibles, one pedipalp, sternum with coxae, genital opercula, abdomen and fragments of legs.

Total length about 16 mm. Cephalothorax 3 25 mm long, 4.25 mm. wide in the widest place, and 3.75 mm. wide at posterior edge,

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2.2 mm. wide at anterior edge, which is straight like the posterior and the side edges. All angles rounded. A median ridge runs in the specimen from the posterior edge forward, soon dividing and forming two curved ridges surrounding the eye tubercle and ending in the anterior corners. Median eyes small, oval, about $^1/_3$ the length of the cephalothorax from the anterior edge. No side eyes visible. The tergites of the abdomen gradually increasing in length, the seventh being the longest. The anterior edge of the fourth, fifth and sixth tergite has a sharp projection in the middle.

The sternum is very large, distinctly pentagonal, with a recurved posterior edge. Apparently both the first and second coxae have maxillary lobes and the second pair is with its posterior edge abutting against the sternum, so that the third and fourth pair are abutting only against the side edges of the sternum, a condition completely resembling the arrangement of coxae in recent scorpions, such as *Opisthacanthus*. The genital opercula occupy the whole width of the sternum and have the shape represented in text figure 11.

Of the post-abdomen or cauda is left only the last segment with the poison gland, both impressed on the seventh abdominal tergite. The tail was evidently bent sidewise and over the tergite when the dead specimen was imbedded in the mud. From the size of the last segment as well as from comparison with the cauda of *P. mazonensis* it is evident that the tail was very small and slim and it seems strange that the seventh tergite has such a wide posterior edge. We must conclude that the cauda was connected with it by means of a comparatively large soft membrane, a condition unlike anything known in modern scorpions.

Both mandibles are preserved except for their basal joint and are almost egg-shaped.

The palpi are characterized by a short patella and a hand with. very long fingers, characteristic of the family. Femur 2.35 mm, patella 1.75 mm., tibia with finger 6.65 mm. The length of the movable finger is 5.0 mm.

Of the legs are left only the trochanters and femora of the second and third pair and apparently a tibia of the fourth pair.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Palaeopisthacanthus mazonensis n. sp.

Plate II, fig. 1; text figs. 13, 14.

The type and only specimen of this species is in the collection of the U. S. National Museum under the number 37977. The

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obverse shows clearly the cephalothorax, abdomen, post-abdomen, both palpi, one leg complete on the right and fragments of the corresponding leg on the left. The reverse is baldy deformed, yet it is possible to recognize the coxae of the left side, sternum, genital opercula and the basal joints of the comb.

Total length about 23 mm. Cephalothorax 6.6 mm. long and 6.3 mm. wide at posterior edge which is straight, and unlike the preceding species represents the broadest part of the cephalothorax. The anterior edge is somewhat procurved, the anterior angles rounded,

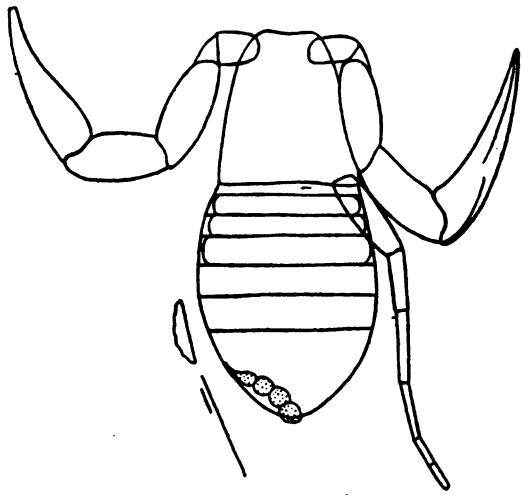

Fig. 13.

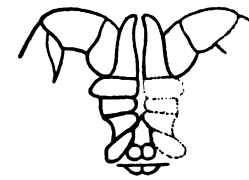

Fig. 14.

Figure 13.—*Palaeopisthacanthus mazonensis* n. sp., holotype, U. S. N. M. No. 37977, dorsal surface. Figure 14.—Same, ventral surface showing the sternum and coxae. $\times \frac{8}{1}$

the posterior ones almost sharp. No eyes are visible. The abdomen is 10.5 mm. long, the tergites gradually increasing in length from the first to the seventh which is as long as the anterior four segments together. It has no distinct posterior edge, but the whole segment has the form of a half oval. The pedipalpi are heavier than in the preceding species Femur 5.0 mm., patella 5.0 mm., tibia with finger 9.0 mm. The length of the movable finger cannot be ascertained. The only completely preserved leg belongs probably to the fourth pair and is 15.0 mm long. Of the post-abdomen which is very short and thin, are preserved the last three segments and the poison gland Like that of the preceding species it was lying over the seventh abdominal tergite when the specimen baceme imbedded in the mud. The segments are short and broad, the poison gland with a curved stign.

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The arrangement of the coxae is different from that of the preceeding species. The first coxae alone show maxillary lobes which are long, slightly curved and somewhat pointed at the distal end. If the second coxae had any maxillary lobes there is no trace left of them. The coxae themselves lie in front of the sternum. The third coxae abut against the triangular part of the sternum, the fourth against its sides. The sternum is distinctly pentagonal, longer than wide, and comparatively small. The genital opercula are circular. The basal joint of the comb consists of two semioval plates. The sternites of the abdomen cannot be made out with clearness. The whole body is smooth.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Family Cyclophthalmidae

Eoctonus n. gen.

Hand short and wide with almost straight, short fingers. Fifth post-abdominal segment considerably longer than the preceding, $2^1/_2$ times as long as high. Genotype *E. miniatus* n. sp.

Owing to the poor preservating of the specimens this genus is as badly characterized as the other three genera, all from Europe, belonging to the same family. *Eoctonus* may be distinguished from *Palaeomachus* and *Archaeoctonus* by the shape of the seventh post-abdominal segment and the hand; from *Cyclophthalmus* by the same characters as well as the shape of the cephalothorax. None of the four genera, is however, sufficiently characterized to warrant a safe position in the system and they have only relative value.

Eoctonus miniatus n. sp.

Plate III, figs. 14, 15; text fig. 15.

This species is represented by two specimens in the Peabody Museum. I chose as the holotype the specimen numbered 131 and represented in Plate III, fig. 14. Although both halves of the nodule containing this specimen are in existence, the dorsal surface alone appears on both. It shows the complete body, both mandibles, one pedipalp, part of the fingers of the other pedipalp, and the trochanters and proximal parts of femora of four legs of the left side. Total length 14.0 mm. Cephalothorax a little narrower in front than behind, 1.7 mm. long and 1.5 mm. wide at posterior edge. Abdomen 5.7 mm. long; post-abdomen, not including the poison gland, 6.6 mm. The right pedipalp is 5.2 mm. long, its

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femur is more slender and considerably longer than the patella. The hand is as wide as the patella, the immovable finger comparatively short and almost straight. The median eyes are small, oval, about $^1/_4$ the length of the cephalothorax distant from the anterior edge. Side eyes not present or at any rate not preserved. The abdominal tergites increase in length from the first to the seventh which is the longest. The second to sixth tergites have each a median crest and the fifth and sixth have besides two short, curved grooves, diverging posteriorly. The post-abdomen lies on its side and each segment shows two deep grooves which correspond to what have been in life the lateral crests. The seventh post-abdominal segment is slightly longer than the cephalothorax and $2^1/_2$ times sa long as high. The poison gland is small with a curved sting and without a spine.

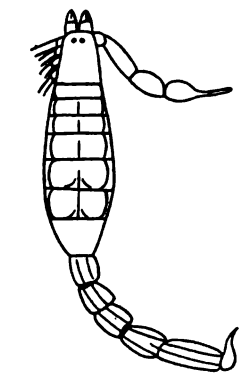

Fig. 15.

Figure 15. — *Eoctonus minixtus* n. sp., holotype, Peabody Mus. No. 131. × $\frac{4}{1}$

Specimen No. 132, Plate III, fig. 15, is considerably larger, but resembles in all details the type specimen. Although the nodule containing this specimen shows both the obverse and reverse, yet the ventral surface is so badly deformed, that no details of structure can be made out. Total length 21.2 mm. Cephalothorax 3.0 mm. long. Its correct width cannot be ascertained owing to the fact that the specimen is considerably compressed longitudinally. Two oval eyes about $^1/_3$ the length of the cephalothorax distant from the anterior edge. Abdomen 7.3 mm. long, post-abdomen 11.5 mm. (not including the poison gland). Seventh post-abdominal segment as long as the cephalothorax and $2^1/_2$ times longer than high. Right pedipalp 12.5 mm. long, the hand somewhat slenderer than in the type specimen. The fourth left coxa, the only one visible, is abutting against the sternum, but the shape of the latter cannot be ascertained. The genital opercula are in the form of a transverse figure ∞.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

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Family Isobuthidae.

Palaeobuthus n. gen.

Sternum triangular. Third coxae abutting against the sternum, fourth against the ellipsoidal genital operculum. Abdominal sternites with straight posterior edges. Genotype *P. distinctus* n. sp.

Palaeobuthus distinctus n. sp.

Plate I, fig. 5; text fig. 16.

The nodule containing the type and only specimen of the species and genus consists of two halves the one of which is so badly deformed that nothing can be made out clearly. The obverse, however, is very well preserved and shows the sternum, genital operculum, comb, abdomen, four and a third post-abdominal segments, third and fourth pairs of coxae, and fragments of legs. No traces of other appendages are left, but for a part of the tibia with finger of the right pedipalp on the obverse, showing that the specimen had a narrow hand with probably long fingers.

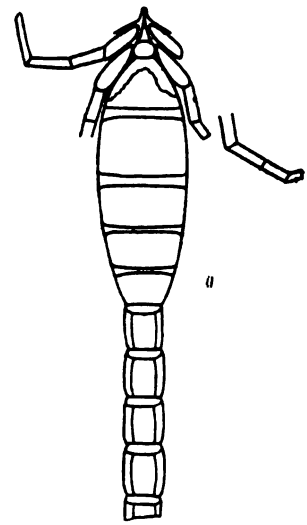

Fig. 16.

Figure 16.—*Palaeobuthus distinctus* n. sp., holotype, Peabody Mus. No. 133, ventral surface. × $\frac{1.5}{1}$

The sternum is small, triangular, with a spine-like projection running between the second pair of coxae. The genital operculum is transversely ellipsoidal, wider than the base of the sternum. Against it are abutting the ends of the fourth coxae. The comb is clearly defined, but the teeth do not show the lines between them and therefore cannot be counted. The abdomen is 22.0 mm. long from base of the genital operculum to end of last sternite. The second sternite is by far the longest. The posterior edge of all sternites is entire, almost straight and not bilobed as in *Eobuthus*. The four post-abdominal segments measure together 17.0 mm. Length of straight line from genital operculum to base of hand 23.0 mm. Length of visible fragment of hand with finger 5.5 mm., width of hand 1.8 mm. Probable length of specimen 55 mm. The whole body is smooth.

No. 133 in the collection of the Peabody Museum.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

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Family Mazonidae.

A very little known family represented by one genus with one species only. Middle eyes large, sitting on a tubercle close to anterior edge of the cephalothorax. Post-abdomen, chelae, palpi and sternum with coxae unknown.

Genus *Mazonia* Meek and Worthen 1868.

With the characters of the family.

Genotype and only species *M. woodiana* M. and W.

Mazonia woodiana Meek and Worthen.

Plate III, fig. 13.

Mazonia woodiana Meek and Worthen, Geol. Surv. Ill., 1868, Vol. III, p. 653 with figure.

The description of this unique specimen given by Meek and Worthen is sufficiently exact to be quoted here almost in full. But their interpretation is at variance with mine, and I will therefore add my views below.

" The only specimen of the type of this proposed genus and species yet known, is in a crushed condition, and of course shows but few of its characters. Its cephalothorax is moderately convex, of a subquadrangular form (its length being about 11.25 mm., and its breadth 10.5 mm.), with rounded anterior lateral margins, and the anterior margin transversely truncated on each side of a small triangular mesial projection. Its posterior lateral regions slope off abruptly from an obscure ridge extending obliquely forward and outward, from near the middle of the posterior margin, to a point near the middle of each side, the sloping surface being marked by a few very minute irregularly scattering granules. From near the posterior margin, a mesial furrow extends forward, widening and deepening rapidly to the front, where it occupies one-third of the entire breadth, and is partly filled by the oculiferous prominence, which is the most elevated part, and bears on each side a large eye. These mesial eyes (the only ones known, or believed to exist) are circular, convex, about 1.75—2.00 mm. in diameter, and arranged for looking obliquely forward, outward and upward. They are each surrounded by a ridge, and so much elevated as to be seen almost entirely above the surface of the cephalothorax on each side. *No traces of lateral eyes* can be seen in the specimen, even by the aid of a magnifier, although the anterior lateral margins (particularly on one side) are well preserved.

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" The abdomen measures about 33.65 mm. in length, and near 13.7 mm. in breadth, as seen in its crushed condition. There appear to be at least seven segments, with just space enough between the anterior, or seventh one seen, and the cephalothorax, for an eighth one. Excepting the posterior one (which is ornamented on the central region of the posterior half with small granules, some of which are arranged in longitudinal rows), these segments seem to be smooth. The exact outline of the posterior segment is not clearly seen in the specimen. . . . In clearing away the matrix, its posterior margin was seen to be truncated, as if for the attachment of a stout tail, but trying to work away more of the matrix, its margin was broken away so that it does not now show the truncated edge so clearly as represented in the figure. Its lateral margins are somewhat flattened No traces of the tail are preserved, the concretion being too small to have included it.

" Just in front of the cephalothorax, extending obliquely forward, and outward to the right, a part of apparently one of the palpi is seen in the matrix. Unfortunately, however, its terminal portion is broken away. It seems to have been long and slender. At the inner end, there appears to be but one, though there may be two, short joints, and beyond these, there are two long slender ones. . . . An obscure impression of a part of one of the legs is also seen farther back, extending out from the right side."

As will be seen from the above quotation, Meek and Worthen suppose that the abdomen may have been composed of eight segments, in which case, if *Mazonia* is a scorpion, the cauda must have been only of four segments, since the number of segments in all known scorpions is twelve. On examining the specimen I too came to the conclusion that the last segment shows all semblance of the seventh abdominal tergite of a normal scorpion. There is also no doubt that behind the cephalothorax is a segment. It may be clearly seen even on the photograph. The two alternativs would be therefore that this segment represents the last thoracic segment which remained free as is the case in Solifugae and Palpigradi or the pregenital segment characteristic of embryos. Neither of these alternatives, however, finds a support in the structure of either extinct or recent scorpions. One could rather conceive a scorpion with six abdominal and six caudal segments, as that would be more in agreement with some Eurypterids and Xiphosura. Perhaps Mazonia had after all no distinct separation between abdomen and cauda, and the last four segments were small. In that case it could be considered a transitional form be-

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tween scorpions and Pedipalpi, not in the sense that *Mazonia* was an ancestor of Pedipalpi, which it certainly was not, but that it represents a tendency in the same direction of diminution in size of the last segments.

To the description of Meek and Worthen may be added that in front of the cephalothorax are visible the impressions of the first joints of the mandibles, but it is not possible to decide whether the mandibles were chelate or retroverte. Pocock thinks that a separate group should be created for *Mazonia*, and I fully agree with him on this point. But the specimen is too fragmentary for that purpose and this is the reason why I have retained the genus *Mazonia* in the order of scorpions where it has been originally placed. The specimen was found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois. At present it is in the collection of the University of Illinois, at Urbana, Illinois.

Scudder has described two other specimens of *Mazonia*; the one he calls *M. acadica*, the other *Mazonia* sp. (cf. Geol. Surv. Canada, Vol. II, 1895, pp. 62–65, pl. V, figs. 4–9). I have carefully examined both specimens but am not able to find sufficient characters to place them among the arachnids. They represent what may have been an arthropod, but nothing more definite can be said about them.

ORDER PEDIPALPI

With the exception of the recent family Schizonotidae in which the two last thoracic segments, fused together, are movably jointed to the anterior part of the cephalothorax, the head is completely fused with the thorax. The abdomen, composed of eleven to twelve segments, is never broadly joined to the cephalothorax. The chelicera always retroverte; the pedipalpi powerful, raptorial, retroverte or chelate. The first pair of legs modified as tactile organs. All five post-oral appendages with a patella.[1] Two pairs of lungs

[1] Kraepelin is certainly in error when he calls the patella of the pedipalp, tibia, and the tibia, hand. The muscular system of the patella is characteristic of this joint. But whereas in scorpions the chelate pedipalp hand is formed by the tibia with its process as immovable finger and the tarso-metatarsus as movable finger, the immovable finger of Pedipalpi is usually formed by the process of the patella. There is often a line of separation between the tarsus and metatarsus as shown in text figure 17.

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with stigmata at the posterior edge of the second and third abdominal sternites. Genital opening between the second and third sternites.

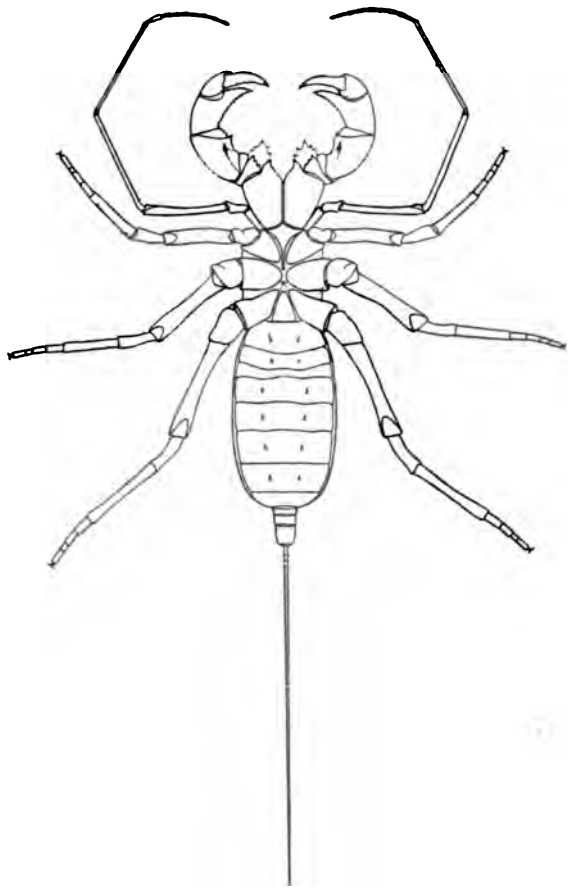

Fig. 17.

Figure 17.—*Mastigoproctus giganteus*, from Texas.

Recent forms probably all oviparous. Two median and in recent forms three pairs of lateral eyes, sometimes totally blind. All Pedipalpi are tropical or subtropical forms. They lead a nocturnal life, hiding during the day under rocks, also in dark places of human dwellings. For the palaeontologist dealing often with imperfectly preserved specimens, the position and structure of the coxae are

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of great importance. In the sub-order Uropygi or whip scorpions the coxae of the pedipalpi are so large that they cover completely the chelicera. Movably jointed to the anterior part of the sternum they meet in the middle line. Immediately behind them are the coxae of the second pair of legs, while the considerably smaller first coxae, widely separated from each other, are situated in front of the anterior distal corner of the second at the sides of the palpal coxae. In the sub-order Amblypygi the coxae of the pedipalpi do not meet in the middle line, being separated from each other by the anterior part of the sternum, while the weak first coxae are so situated that their sides are in contact with the distal part of both the palpal and second coxae. No other arachnids have anything similar to the arrangement of the coxae in both sub-orders of Pedipalpi.

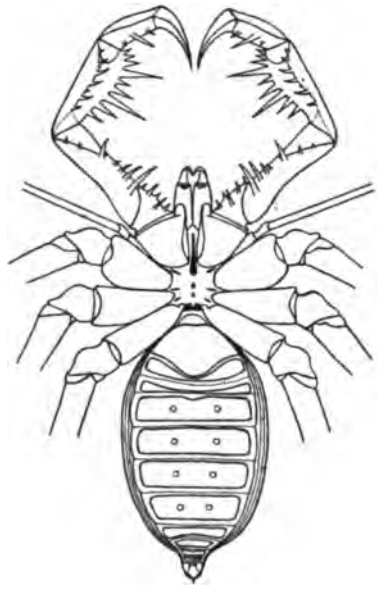

Fig. 18.

Figure 18.—*Tarantula fuscimana*, from Central America, a representative of the suborder Amblypygi.

LIST OF DESCRIBED SPECIES OF PEDIPALPI

Sub-Order Uropygi.

Cephalothorax longer than wide. Abdomen with a segmented whip or a short style. Coxae of pedipalpi meeting in the middle line.

Pamily Thelyphonidae Lucas.[1]

Cephalothorax entire. Abdomen with a segmented whip.

[1] Family Geralinuridae Scudder is a synonym of Theliphonidae. Its definition was based on specimens incorrectly described. Moreover it includes the genus *Graeophonus* which belongs to the sub-order Amblypygi.

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Genus *Geralinura* Scudder[1] 1884.

Genotype *G. carbonaria* Scudder.

1. *G. carbonaria* Scudder, Proc. Amer. Acad. Arts Sci., Vol. XX, 1884, p. 19. Id., Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 455, pl. 39, fig. 1 (nec 3 and 4).
   From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.
2. *G. similis* n. sp.
   = *G. carbonaria* Scudder, Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 455 ad partem, pl. 39, figs. 3 and 4 (nec fig. 1).
   From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.
3. *G. gigantea* n. sp.
   From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.
4. *G. bohemica* (Kuśta).
   = *Telyphonus bohemicus* Kuśta, Sitz. k. böhm. Ges. d. Wiss., 1884, p. 186, pl. I.
   = *G. bohemica* Id., Ibid., 1888.
   = *G. scuddari* Id., Ibid., 1888, p. 205, pl. fig. 5.
   ?= *G. noctua* Id., Ibid., p. 201, pl. fig. 6.
   ?= *G. crassa* Id., Ibid., 1888, p. 203.
   = *Protelyphonus bohemicus* Fritsch, Pal. Arachn., 1904, pp. 59–62, pl. 6, figs. 1–8, text figs. 71–77.
   From the Carboniferous (Noegerathienschiefer, Coal Measures) near Rakonitz, Bohemia.
5. *G. britannica* Pocock, Carb. Arachn., 1911, p. 29, pl. I, fig. 3; pl. II, fig. 3; text fig. 9.
   From the Coal Measures of Coseley, near Dudley, England.

Sub-Order Amblypygi.

Cephalothorax wider than long. Coxae of pedipalpi not meeting in middle line. Abdomen without a whip.

Family Tarantulidae Karsch.

With all the characters of the sub-order.

Genus *Graeophonus* Scudder 1890.

Genotype *G. carbonarius* Scudder.

1. *G. carbonarius* Scudder.
   = *Libellula carbonaria* Scudder, Can. Nat. (2), Vol. VIII, 1876, p. 88, fig. 1.
   G. carbonarius Id., Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 454, pl. 40, figs. 2, 3, 6.

[1] *Protelyphonus* Fritsch is a synonym of *Geralinura*.

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From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

2. *G. anglicus* Pocock, Carb. Arachn., 1911, p. 32, pl. I, figs. 4–4d.
From the Coal Mesaures of Coseley, near Dudley, England.

Telyphrynus n. gen.

Genotype *T. elongatus* n. sp.

1. T. elongatus n. sp.
From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Protophrynus n. gen.

Genotype *P. carbonarius* n. sp.

1. *P. carbonarius* n. sp.
From the Pennsylvanic (Lower Allegheny.) of Mazon Creek, Illinois.

KEY TO GENERA OF NORTH AMERICAN CARBONIFEROUS PEDIPALPI

1. Cephalothorax longer than broad. Abdomen with a whip—Sub-order Uropygi *Geralinura.*
+ Cephalothorax wider than long. Abdomen without a whip—Sub-order Amblypygi 2
2. Coxae of 3d and 4th pair of legs joined in a median line, not triangular. Eyes absent *Telyphrynus.*
+ coxae of 3d and 4th pair of legs converging toward a point 3
3. Abdomen with 7 visible tergites. Trochanters 1-jointed. Four eyes *Protophrynus.*
+ abdomen with 10 tergites. Trochanters 2-jointed. Two eyes *Graeophonus.*

DESCRIPTION OF NORTH AMERICAN CARBONIFEROUS PEDIPALPI

Sub-Order Uropygi.

Family Thelyphonidae Lucas

Genus *Geralinura* Scudder.

(New definition.) Cephalothorax entire, longer than wide. Sternum composed of one piece. Abdomen with twelve segments. Whip many jointed.

Key to North American Species of Geralinura.

1. No constriction between the cephalothorax and the first abdominal tergite. Coxae of 4th pair of legs rectangular and contiguous *G. similis* n. sp.
+ a distinct constriction between the cephalothorax and the 1st abdominal tergite; abdomen anteriorly rounded 2

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2. Cephalothorax oval
G. carbonaria Scudder.
+ cephalothorax anteriorly truncated
G. gigantea n. sp.

Geralinura carbonaria Scudder.

Plate IV, figs. 21, 22; text figs. 19, 20.

G. carbonaria Scudder, Proc. Amer. Acad. Arts Sci., Vol. XX, 1884, p. 19. Id., Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 455, pl. 39, fig. 1.

Scudder's description of this species is based on two specimens one of which, specimen a, alone belongs to it and is therefore the type. Specimen b is undoubtedly a different species and forms the type of *G. similis* n. sp.

The type specimen was originally labelled 1754 a and b, but is at present in the collection of the U. S. National Museum under the number 37985. Both the obverse and the reverse are well preserved. The obverse shows the cephalothorax, abdomen, and fragments of pedipalpi and legs; the reverse the sternum with coxae and femora, abdomen, and five segments of the whip.

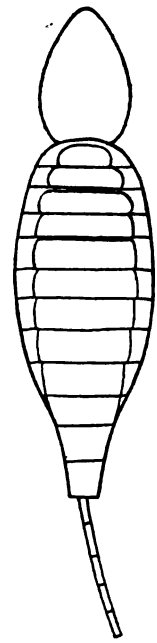

Fig. 19.

Fig. 20.

Figure 19.—*Geralinura carbonaria* Scudder, holotype a, U. S. N. M. No. 37985 (1754a and b), dorsal surface. × $\frac{4}{1}$.
Figure 20.—Same, sternum. × $\frac{8}{1}$

The cephalothorax is oval, 4.03 mm. long; its greatest width is about $^1/_3$ from posterior edge and measures 3.0 mm. Eyes are absent. The abdomen is 11.8 mm. long, rounded in front; the total length of the specimen to base of tail, 16.0 mm. The anterior ten segments of the abdomen are subequal in length and their tergites are considerably narrower than the width of the abdomen. The eleventh and twelfth segments are somewhat longer than the preceding ones and considerably narrower, but there is no abrupt difference in size, the abdomen narrowing posteriorly, but gradually. The five segments of the whip measure together 4.06 mm. The

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arrangement of all coxae is exactly the same as in *G. similis*, but the sternum is somewhat different as will be readily understood from a comparison of text figures 20 and 22. The femur of the third pair of legs is 2.8 mm. long, that of the fourth 3.7 mm. (Scudder's figures include the trochanters). The whole body is smooth. Only one specimen in existence.

From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Geralinura similis n. *sp.*

Plate IV, figs. 19, 20; text figs. 21, 22.

= *G. carbonaria* Scudder, ad partem, Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, specimen b, pl. 39, figs. 3–4.

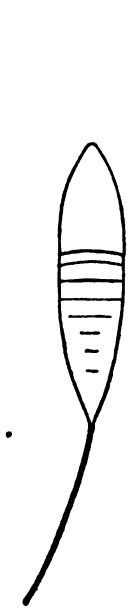

Fig. 21.

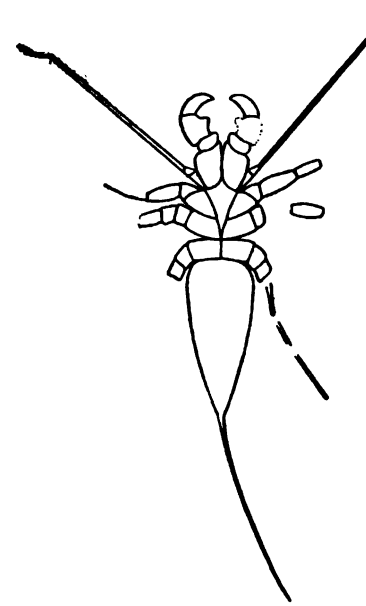

Fig. 22.

Figure 21.—*Geralinura similis* n. sp., holotype b, U. S. N. M. No. 37985 (1754c), dorsal surface. Figure 22.—Same, ventral surface, showing the arrangement of the coxae. $\times \frac{2.5}{1}$

As I have already pointed out, the type and only specimen of this species, at present in the collection of the U. S. National Museum, is easily distinguished from *G. carbonaria* by the shape of the cephalothorax and abdomen, as well as by the sternum. Total length to base of whip 14 mm. Cephalothorax 5.25 mm. long, 3.0 mm. wide at posterior edge which is slightly recurved. Eyes absent. First ab-

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dominal segment same width as cephalothorax, but the constriction between cephalothorax and abdomen is well visible on the ventral surface. Segmentation of abdomen indistinct, neither the tergites, nor the sternites being preserved. Whip 10 mm. long. Pedipalpi heavy, their coxae meeting in the median line, longer than wide, with a distal internal process. The trochanters wider than long, the femora with a process at inner edge. The patellae curved, their distal end possibly representing the immovable finger. Tibia and tarso-metatarsi lost. The first coxae as in recent Thelyphonidae. The femora long and thin, the rest not preserved with exception of the proximal end of the patellae. First femur 8.5 mm. long. Second femur much thicker and only 1.75 mm. long. The sternum 3.00 mm. long, pointed behind. The coxae of the second pair conical, those of the third pair with parallel sides, diverging in front, contiguous at posterior end. Coxae of fourth pair contiguous, rectangular. It is doubtful whether the fourth leg is as thin as it appears, more probably it was as heavy as the second and third, this being indicated by the width of the proximal fragment of the femur.

From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Geralinura gigantea n. sp.

Plate V, figs. 23–25; text figs. 23–26.

The holotype of this species is in the collection of the U. S. National Museum under the number 37976. The obverse shows the cephalothorax, five segments of the abdomen, pedipalpi, chelicera and fragments of legs; the reverse, the palpi, chelicera, coxae of all legs, abdomen, almost complete first right leg and several joints of the remaining legs. The whip is not preserved.

Total length 21.0 mm. The flat, excellently preserved cephalothorax is 6.3 mm. long and 4.5 mm. wide $^2/_3$ from anterior edge, i. e., in its widest place. Anteriorly the cephalothorax is truncated, the posterior edge is very slightly recurved, almost straight and about twice as wide as the anterior edge. Immediately behind the widest place there is a conspicuous median ridge sloping posteriorly and anteriorly where it goes over gradually into curved grooves running towards the deep lateral grooves. The lateral grooves themselves begin at anterior edge and run parallel to the sides of the cephalothorax. They represent the moulds of the lateral crests as in recent forms, and the enlarged portion of their posterior end may have been the place where the lateral eyes were in the living specimen, but no trace of the lenses is left. The middle eyes are oval, small, separated

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from each other and from the anterior edge by about their diameter. The mandibles or chelicera are unusually large, but only the basal joint visible, so that it is not possible to decide whether the fang was movable upward and downward as in recent forms, or inward and outward as in true spiders. The former is, however, more probable since it is the rule in all recent pedipalpi.

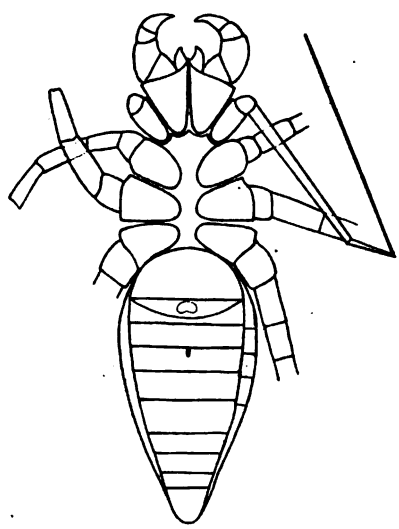

Fig. 23.

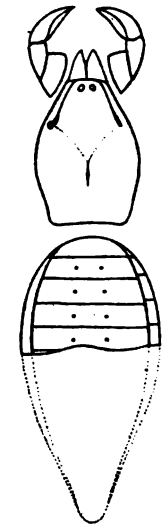

Fig. 24.

Figure 23.—*Geralinura gigantea* n. sp., from the Upper Coal Measures, Braidwood, Illniois, holotype, U. S. N. M. No. 37976, ventral surface, showing arrangement of coxae. Figure 24.—Same, dorsal surface. $\times \frac{3}{1}$

The abdomen is rounded in front, gradually narrowing posteriorly. The pleura are well visible and were soft and entire, the irregular segmentation appearing in the specimen being due probably to artificial folding. The second to fifth abdominal tergites show clearly the round attachment points of the dorso-ventral muscles, one pair in each segment. On the ventral side one can see only ten sternites. Of these the first, corresponding to the first and second segments, is by far the largest and has a semicircular shape. The second sternite has the shape of a segment, its posterior edge being procurved. Impressed on it we see the bean-shaped genital opening. Only the anterior edge of the sternum is preserved and this is peculiar in its structure inasmuch as it has articulation surfaces not only for the pedipalpi, but also for the coxae of the first pair of legs. The pedi-

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palpi are heavy and rather short and the immovable finger is formed by the tibia and not by the patella. The coxae of the first pair of legs are unusually heavy, the femur 7.3 mm. long, getting evenly thinner toward its distal end. The patella is about as long as the coxa. Whether the last visible joint represents only the tibia, or whether some joints of the tactile organ form the end of it, is not possible to decide. The second, third and fourth pair of legs were short and stout and their coxae at even distances from each other. The whole body is smooth.

In the same nodule is a marine lamellibranchiate.

Specimen No. 147 of the Peabody Museum. Plate V, fig. 25; text figs. 25, 26. Paratype.

Total size 22.0 mm. Cephalothorax 5.65 mm. long, 4.3 mm. wide in the widest place, has the same shape and structure as in the type specimen. Middle eyes not preserved. Mandibles visible only on the obverse. Palpi much heavier than in the type specimen, their fingers not preserved. The sternum as in type, but the metasternum clearly visible in front of the first abdominal sternite, separating the hind

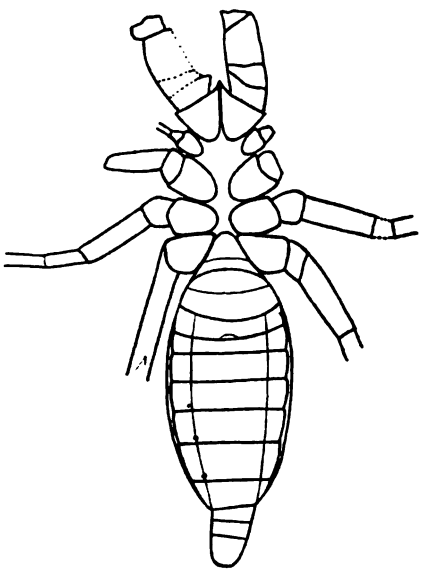

Fig. 25.

Fig. 26.

Figure 25.—*Geralinura gigantea* n. sp., paratype, Peabody Mus. No. 147, ventral surface. Figure 26.—Same, dorsal surface. × $\frac{8}{1}$

coxae. The first abdominal sternite with a procurved posterior edge. The second with both edges procurved, almost concentric. At the posterior edge the impression of a semilunar genital opening. The last three abdominal segments set off sharply from the preceding segment, much as in recent whip scorpions. Of the legs only frag-

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ments preserved as shown in text figure 25. Notwithstanding the differences in the shape of the pedipalpi, of the coxae of the first pair of legs and of the last three abdominal segments, the similarity in size and structure between the cotype and type is so great, that I am rather inclined to attribute the differences to sexual dimorphism than to make a separate species of the cotype.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Sub-Order Amblypygi.
Family Tarantulidae Karsch.
Thelyphrynus n. gen.

Cephalothorax wider than long, bean-shaped. Eyes absent. Coxae of third and fourth pair contiguous, not triangular. Genotype *T. elongatus* n. sp.

Thelyphrynus elongatus n. sp.
Plate V, fig. 26; text figs. 27, 28.

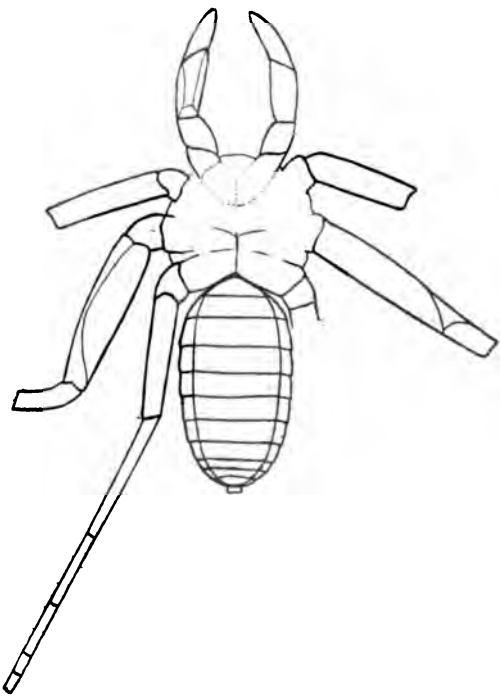

Fig. 27.

Fig. 28.

Figure 27.—*Thelyphrynus elongatus* n. sp., holotype, Daniels coll., ventral surface. Figure 28.—Same, cephalothorax. × $\frac{8}{1}$

The type and only specimen of this species, showing only the reverse, is in the collection of Mr. L. E. Daniels. It shows the pedipalpi, trochanters and femora of the second pair of legs, trochanters, femora and patellae of the third pair, an almost complete fourth leg, faint impressions of the coxae of the third and fourth pair, complete abdomen and superimposed over the coxae the cephalothorax.

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Total length without pedipalps 16 mm. Cephalothorax 4.1 mm. long, 5.8 mm. wide in the widest place, with a median depression as in text figure 28. Abdomen 9.6 mm. long; it consists of eleven segments and a short pygidium. The pleura is clearly segmented. The pedipalpi are heavy and long. The first pair of legs is not preserved, but presumably it was thin and long. The second femur is 5 mm. long, the third 7 mm. The fourth leg is much thinner than the third, its femur is 5.6 mm. long, and the total length of this leg from the base of the trochanter to the end of the last visible joint is 21 mm. Whether the transverse lines represent the limits of joints it is not possible to ascertain. The whole body is smooth.

The general appearance of this specimen reminds one much of a true whip scorpion, but the shape of the cephalothorax is characteristic of the sub-order Amblypygi and there are no signs of a whip, although the abdomen is in an excellent state of preservation.

From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Genus *Graeophonus* Scudder 1890.

New definition. Cephalothorax wider than long, reniform, with one pair of eyes placed on an eye tubercle. Third and fourth pair of coxae triangular, meeting in a median point. Trochanters two-jointed. Abdominal tergites ten. Genotype *G. carbonarius* Scudder.

Graeophonus carbonarius (Scudder).

Plate V, figs. 27—29; text figs. 29—31.

= *Libellula carbonaria* Scudder, Can. Nat., (2), Vol. VIII, 1876, p. 88, fig. 1.

G. carbonarius Id., Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 454, pl. 40, figs. 2, 3, 6.

Scudder drew the characters of this species from specimen No. 1762 of the Lacoe collection " before it was recognized as the same species as that described by many years ago from an abdomen alone, under the name of *Libellula carbonaria.*" Since both specimens received the same specific name and since the generic characters were first drawn by Scudder from specimen No. 1762, moreover since this specimen is the more complete one, it should have the value of the holotype. We must remember that characters of extinct arachnids do not have the same value as those of recent forms. It is probable that Libellula carbonaria belongs to the same genus and species as *Graeophonus carbonarius,* but the specimen is too incomplete to make it an absolute certainty. I have carefully compared the type specimen of *Libellula carbonaria* with the type specimen of *Graeophonus carbonarius*

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and believe them to belong to the same species, as far as one may judge from the abdomen alone. But in the systematics of Amblypygi the abdomen is the least important part of the body and may not have even generic value. I therefore regard as type specimen No. 1762 of the Lacoe collection. The description of Scudder is not correct. He describes the palpi as chelate, whereas they are incomplete and consequently show no chela. He also describes the second pair of legs as the first, but the first pair is

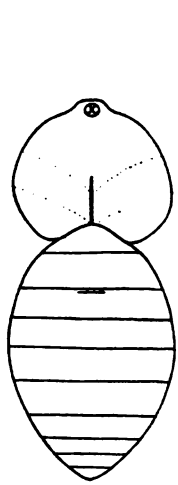

Fig. 29.

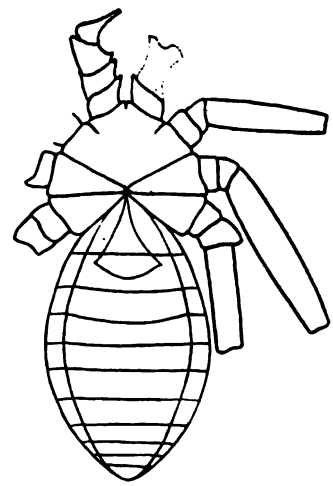

Fig. 30.

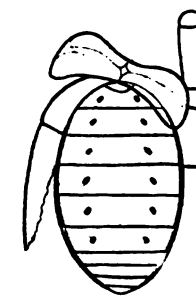

Fig. 31.

Figure 29.—*Graeophonus carbonarius* holotype, U. S. N. M. No. 37969, dorsal surface. Figure 30.—Same, ventral surface. Figure 31.—*Graeophonus carbonarius* (Scudder), from the Upper Coal Measures, Joggins Mines, Nova Scotia, specimen No. 37964 of the U. S. National Museum, dorsal surface. $\times \frac{3}{1}$

lost altogether. The following description of the type is made after the specimen has been cleaned from the kaolin which was hiding from view many of its structures.

Total length 17.0 mm. Cephalothorax reniform, with a slight projection in front of the eye tubercle, 5.66 mm. long in the middle line and 7.0 mm. wide about $^2/_3$ from anterior edge. A median crest extends from the middle of the cephalothorax to its posterior edge. Two pairs of oblique, curved crests run from the sides of the cephalothorax to the median crest. Eyes round, contiguous, on a round tubercle (depression in the specimen being the mould of the tubercle) close to anterior edge. Abdomen oval, without pygidium. On the dorsal surface may be counted ten tergites, on the ventral eleven

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sternites. The pleura is preserved only on the ventral surface and is segmented. A deep, triangular depression extends from the anterior end of the abdomen to the middle of the second sternite, possibly the result of deformation. Of the coxae only those of the third and fourth pair are preserved. They are triangular and their apices meet in a median point. The pedipalpi are heavy, their joints wider than long. The tarso-metatarsus is lost, the tibia has a long internal process which may have had the function of an immovable finger. The second femur is 5.3 mm. long, the third 7.9 mm., the fourth (incomplete) 4.8 mm. The trochanters of the legs (andpalpi ?) are two-jointed.

Specimen No 3085 in the collection of McGill University is the type specimen of *Libellula carbonaria*. I can add nothing to Scudder's description and refer the reader to his plate 40, figs. 2, 6.

Specimen No. 37964 of the U. S. National Museum from the Joggins Mines, Nova Scotia, text figure 31, plate V, figure 29, belongs probably to the same species.

The cephalothorax of this specimen is so badly deformed that it is impossible to reconstruct its shape. The abdomen is excellently preserved and is composed of ten segments. A pair of oval depressions in each of the first six tergites represent the places of attachment of the dorso-ventral muscles. Only fractions of two legs are preserved and they show that the legs were fully as heavy as in the type specimen. The abdomen is 9.3 mm. long and 5.7 mm. wide.

The type specimen is from the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois; the type of *Libellula carbonaria* from the Pennsylvanic ("Millstone Grit") of Cape Breton; and specimen No. 37964 from the Upper Coal Measures at Joggins Mines, Nova Scotia.

Protophrynus n. gen.

Cephalothorax broader than long, reniform, with two pairs of eyes. Trochanters normal, one-jointed. Abdomen with seven tergites. Genotype *P. carbonarius* n. sp.

Protophrynus carbonarius n. sp.

Plate VI, figs. 30, 31; text figs. 32, 33.

The type and only specimen of this species is in the collection of Mr. L. E. Daniels. Both the obverse and reverse are well preserved. The flat cephalothorax is reniform with a wide projection in front, 5 mm. long, 7 mm. wide. It has a median crest and lateral crests radiating from it, being moulds of the longitudinal and thoracic grooves. Two small, round median eyes close to anterior edge and two larger, round, lateral eyes touching the sides of the projection. Abdomen

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7 mm. long, oval, with seven tergites. The coxae of the pedipalp small, the pedipalpi not heavier than the second legs, Trochanters of all appendages normal, one-jointed. The femora of the pedipalpi short and stout. The other joints missing. Immediately behind the palps

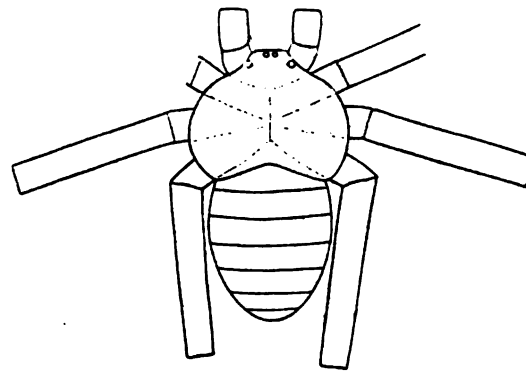

Fig. 32.

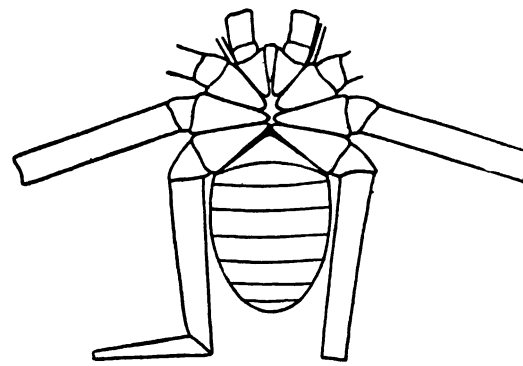

Fig. 33.

Figure 32.—*Protophrynus carbonarius* n. sp., holotype, Daniels coll., dorsal surface. Figure 33.—Same, ventral surface. $\times \frac{8}{1}$

one may see the faint impressions of the proximal part of the thin legs of the first pair. Abdominal sternites eight. The legs must have been very long, if judged by the length of the femora. Third femur 7.5 mm. long, fourth femur 7.8 mm. The whole body smooth and flat.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

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ORDER KUSTARACHNAE

Head completely fused with thorax. Abdomen segmented, probably with a pedicel. All coxae radiating from a central, small sternum, probably immovable. Coxae of pedipalpi fused together without a suture. Pedipalpi chelate. Chelicera not known. Legs thin and long. Eyes to the number of two, placed on a tubercle.

The above characters make it impossible to place the three species of the only genus of this order under any other order. Pocock has pointed out that *Kustarachne sulcata* Melander is a *Curculioides* and thinks that the other species may also belong to the order Ricinulei. As will be shown further below, *Kustarachne sulcata is* a *Curculioides*, but *K. tenuipes* Scudder, *K. extincta* Melander and *K. conica* n. sp. have nothing in common with either extinct or recent Ricinulei, while they are very closely realated to each other.

Genus *Kustarachne* Scudder 1890.

With the characters of the order. Genotype *K. tenuipes* Scudder.

Key to the Species of Kustarachne.

1. Abdomen with 10 sternites *K. extincta*
   + abdomen with 7 sternites 2
2. Abdomen conical without pygidium *K. conica*
   + abdomen oval with a pygidinm *K. tenuipes.*

Kustarachne tenuipes Scudder.

Plate VI, figs. 33, 34; text figs. 34, 35.

K. tenuipes Scudder, Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 450, pl. 40, fig. 7.

The type and only specimen of this species, originally labelled No. 1756 a and b is now in the collection of the U. S. National Museum as No. 37967. Since Scudder's description is incorrect owing to the specimen not having been properly cleaned, the following description should take its place.

Total length 11.5 mm. Cephalothorax with strongly recurved posterior edge, rounded in front, quite flat, 3.0 mm. long in the median line, 5.8 mm. wide between the posterior corners. About $^1/_3$ the length of the cephalothorax from its anterior edge is the mould of the transversely ellipsoidal eye tubercle with two perfectly round eyes. Chelicera missing. The coxae are all triangular, apparently immovable, radiating from a small sternum. The coxae of the pedipalp are completely fused together without a sign of a suture. The palpi themselves are composed of only four segments, the last two forming

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a distinct chela. The trochanters of the first and fourth leg, and probably of all legs are two-jointed, the first joint rectangular, broader than long, the second joint conical. The femora very long and thin. The abdomen oval, the first sternite very large, triangular. The last or seventh sternite the smallest, crescent-shaped. Behind it a short pygidium and at a little distance from the pygidium a fraction of either a whip or of some joint of the last leg which in this case must have been

Fig. 34.

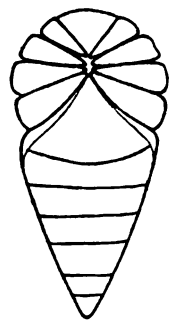

Fig. 36.

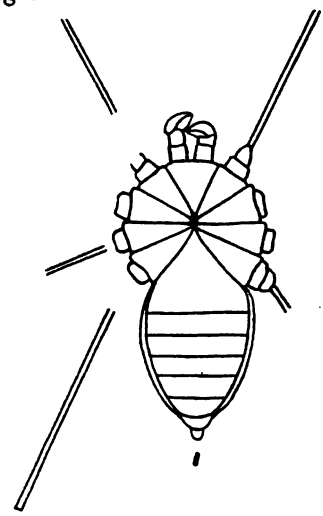

Fig. 35.

Figure 34.—*Kustarachne tenuipes* Scudder, holotype, U. S. N. M. No. 37967, ventral surface. Figure 35.—Same, cephalothorax. × $\frac{8}{1}$. Figure 36.—*Kustarachne conica* n. sp., holotype, Daniels coll., ventral surface. × $\frac{4}{1}$

bent. The former alternative seems, however, to be more probable. The pleurae entire. The abdominal tergites apparently similar in number to the sternites, but not well defined.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Kustarachne conica n. sp.

Plate VI, fig. 35; text fig. 36.

The nodule containing the type and only specimen of this species is in the collection of Mr. L. E. Daniels. The obverse is missing. The reverse is very poorly preserved, owing to pronounced decomposition of the rock. Nothing but the coxae and abdomen is visible. Total size 10 mm. Arrangement of coxae same as in *K. tenuipes*. Abdomen composed of seven segments, without pygidium. The first sternite triangular with a procurved posterior edge.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

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Kustarachne extincta Melander.

Text figs. 37, 38.

K. extincta Melander, Jour. Geol., Vol. XI, 1903, p. 182, pl. V, fig. 4; pl. VII, fig. 5.

The type and only specimen is in the Walker collection of the University of Chicago, No. 9236. Careful cleaning of the specimen showed that the description given by Melander is not correct, and the following description should be substituted.

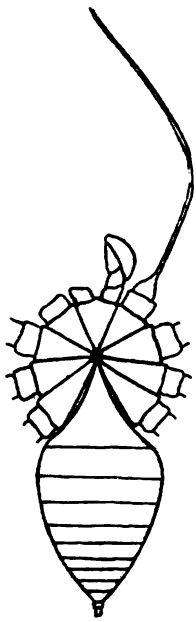

Fig. 37.

Total length 15 mm. Cephalothorax with a slightly recurved posterior edge, rounded in front, 6.0 mm. long, 7.0 mm. wide. Two contiguous, perfectly round eyes on a transversely ellipsoidal tubercle a little in front of the middle of the cephalothorax. Pedipalpi (not counting the coxae) four-jointed, chelate. Arrangement of coxae same as in K. tenuipes, but the fused coxae of the pedipalpi with a slightly angular anterior edge. First and probably all trochanters two-jointed, first joint rectangular, second conical. First leg thin and long other legs missing. Abdomen oval, composed of ten segments with two minute segments behind the tenth rep resenting possibly the first joints of a whip.

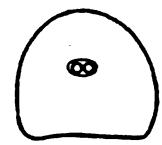

Fig. 38.

Figure 37.—*Kustarachne extincta* Mel., holotype, Univ. of Chicago Mus. No. 9236, ventral surface. Figure 38.—Same, cephalothorax. $\times \frac{2.75}{1}$

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

ORDER SOLIFUGAE

Only the first segment of the thorax fused with the head, the last three segments free. Abdomen composed of ten segments. Chelicera chelate. Pedipalpi pediform. Trochanters of legs two-jointed. Patella absent. Coxa and trochanter of fourth leg with a row of malleoli on underside. Organs of respiration in form of tracheal tubes. First pair of stigmata behind the coxae of the second pair of legs, second pair on the second abdominal segment, third pair on

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the third abdominal segment, and a single stigma on the fourth abdominal segment in some species. Genital opening, protected by two opercula, on the first abdominal segment. Oviparous. The recent Solifugids lead a nocturnal life, feeding on insects. They inhabit hot countries and are preëminently desert forms, although some species are found in tropical rain regions. Until now no representative of this order has been found in any of the geological periods. The recent Solifugae are divided into three families, but the poor preservation of the only Palaeozoic specimen prevents me from placing it in any of them.

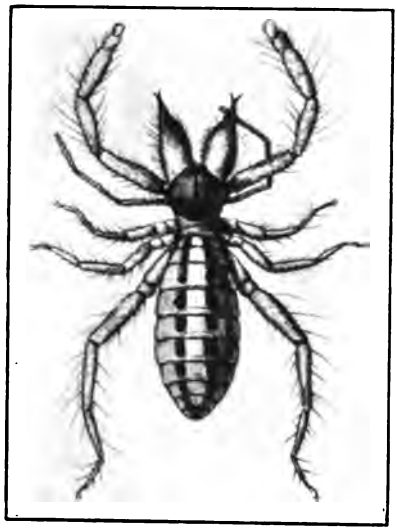

Fig. 39.

Figure 39.—*Ammotrecha cubae* (H. Lucas), a recent solifugid. (From Putnam, The Solifugidae of America, 1883).

Protosolpuga n. gen

Three posterior thoracic segments free. Chelicera chelate, powerful. Pedipalpi pediform, heavy. Second pair of legs considerably thinner than the others. Abdomen apparently composed of seven segments only. Genotype *P. carbonaria* n. sp.

Protosolpuga carbonaria n. sp.

Plate VI, fig. 32; text fig. 40.

The type and only specimen of this interesting arachnid is in the Peabody Museum, No. 155. Unfortunately it is in a very poor state of preservation, the details being exceedingly difficult to see. The lines separating the segments of the thorax and abdomen are very faint. The obverse is fairly well discernible, but the reverse totally useless, since the ventral surface was evidently softer and shows superimposed over it the structures of the dorsal surface.

Total length with chelicera 24.0 mm.; abdomen 12 mm. long. Chelicera heavy, chelate, their ends somewhat curved; a row of small punctuated depressions along their edge. The head much wider than

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long. Eyes absent. Of the three free thoracic segments the anterior one the shortest. Abdomen oval, broader behind than in front, anteriorly truncated, posteriorly rounded. It seems probable that the curved lines belong to the ventral surface and if the straight lines alone are counted, then the abdomen was composed of seven segments only. The pedipalpi both visible, the right one showing even segmentation. They are heavier than the legs and about 22 mm. long, their joints subequal in length with exception of the terminal joint, which is quite small, semilunar. Of the remaining appendages only fragments are preserved. The second pair of legs is considerably thinner than the others, the third leg was probably the shortest if judged by the comparative shortness of its femur.

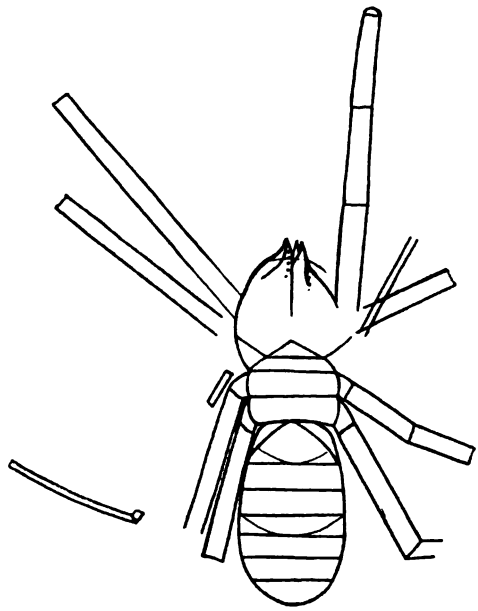

Fig. 40.

Figure 40.—*Protosolpuga carbonaria* n. sp., holotype, Peabody Mus. No. 155, dorsal surface. $\times \frac{2}{1}$

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

ORDER RICINULEI

Arachnids with hard, granulated integument, with a plate or cucullus in front of the cephalothorax and a broad abdomen composed of nine segments with a pedicel and coupled to the cephalothorax by means of a special apparatus. Of the abdominal tergites the third to sixth are by far the largest, usually divided into three areas. The first tergite, or pedicel, and the second tergite are not visible when the abdomen occupies its normal position. The seventh to ninth segments are very small, annular, and form a "tail". Of the sternites the first and second are small, semilunar, seldom visible

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in the normal position of the abdomen. Chelicera two-jointed, chelate. Pedipalpi chelate, composed of coxa, a two-jointed trochanter, femur, tibia and tarsus, the latter forming with a process of the tibia a small chela. All coxae contiguous, those of the anterior three pairs immovable, while the fourth pair is movable. Patella present in all legs. Trochanter of the first and second pair

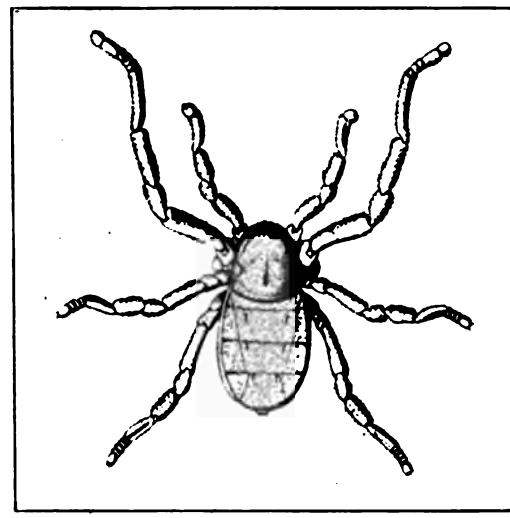

Fig. 41.

Figure 41.—*Cryptostemma karschii* H. and S., a recent representative of the order Ricinulei from Kamerun and Congo; dorsal surface showing the cucullus, cephalothorax, the 3d—6th abdominal tergites, the "tail", and the four pairs of legs. Between the trochanters of the 2d and 3d pair of legs one may see a part of the pedipalpi, which are bent downward.
(From H. J. Hansen and W. Sörensen, On two Orders of Arachnida, 1904.)

of legs single, of the third and fourth pair two-jointed. First tarsus one-jointed, second five-jointed, third four-jointed, fourth five-jointed. In the male the third metatarsus and tarsus are modified, representing probably an organ of copulation. Eyes absent. Genital opening between the first and second sternite. Organs of respiration in form of two tracheal tubes with a pair of spiracles on the cephalothorax. Oviparous. Only few recent species known, all from Africa and South America.

This order may be divided into two families. The family Cryptostemidae Westwood, comprising all recent forms and the extinct

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genus *Polyochera*, is characterized by the visible segmentation of the abdomen. The family Holotergidae, new, contains the single

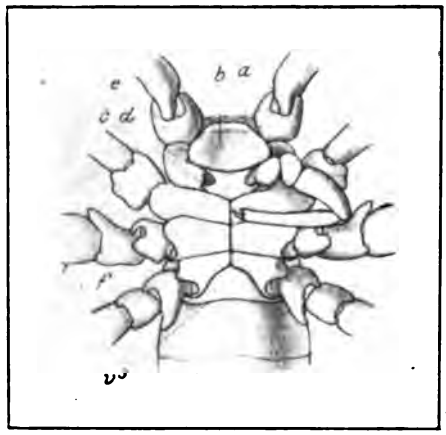

Fig. 42.

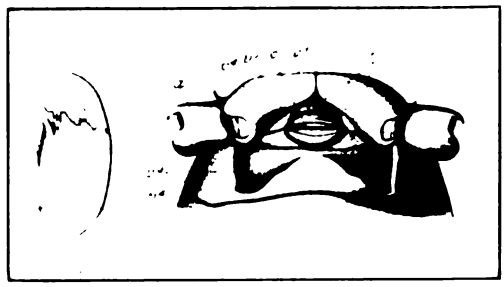

Fig. 43.

Figure 42.—*Cryptocellus simonis* H. and S., from Brazil; underside, showing the cucullus (b), the coxae and trochanters, one pedipalp (the other is removed), and the 3d (v3) and 4th abdominal sternites. Figure 43.—*Cryptostemma afzelii* Thorell, from Africa (Sierra Leone); on the left an isolated mandible; on the right the coxae of the 4th pair of legs (c^4). genital opening (o), 1st abdominal sternite (v^1), 2d sternite (v^2), and 3d sternite (v^3). (From H. J. Hansen and W. Sörensen, On two Orders of Arachnida, 1904.)

extinct genus *Curculioides* and is characterized by the externally unsegmented abdomen which was evidently protected by a heavy, chitinous shield.

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Family *Cryptostemmidae* Westwood.

Abdominal tergites distinctly separate.

Genus *Polyochera* Scudder 1884

Tarsus of second leg fused with the metatarsus, forming one joint. Genotype *P. punctulata* Scudder.

Key to the Species of Polyochera.

1. Abdominal tergites of the 4th, 5th and 6th segments each marked with 2 pairs of round impressions. Cucullus nearly as long as wide *P. alticeps*
   + abdominal tergites divided into fields by 2 or 4 longitudinal lines. Cucullus much wider than long 2
2. No constriction between cephalothorax and abdomen. Body punctulate. Abdominal tergites of the 4th, 5th and 6th segments each divided into 5 fields by longitudinal lines *P. punctulata*
   + a distinct constriction between cephalothorax and abdomen. Body smooth. Abdominal tergites, including that of the 3d segment, divided into 3 fields each by 2 parallel longitudinal lines *P. glabra*

Polyochera alticeps Pocock

P. alticeps Pocock, Carb. Arachn., 1911, p. 40, pl. II, fig. 6; text fig. 14. From the Coal Measures of Coseley, near Dudley, England.

Polyochera punctulata Scudder.

Plate VIII, figs. 41, 42; text figs. 44, 45

P. punctulata Scudder, Proc. Amer. Acad. Arts Sci., Vol. XX, 1884, p. 16. Id., Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 444, pl. 39, figs. 2, 6.

The nodule containing the type specimen, No. 1745 of the Lacoe collection, at present No. 37971 of the U. S. National Museum, shows both the obverse and reverse in an excellent state of preservation. The description of Scudder not being quite correct, the following should be substituted for it.

Total length 15.5 mm. Cucullus 1.0 mm. long, 3.8 mm. wide. Cephalothorax 4.7 mm. long, 5.5 mm. wide at posterior edge which is procurved. Abdomen rounded behind; only the third to sixth tergites visible, the segments composing the "tail" missing. The tergite of the third abdominal segment, the one adjoining the cephalothorax, is the shortest; the tergite of the sixth, or last visible seg-

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ment, the longest. Chelicera and pedipalpi missing. All legs with a patella. First leg somewhat thinner than the others. Trochanter of the first and second pair of legs one-jointed, of the third and fourth pair two-jointed. Last joint of second leg formed by a tarso-metatarsus with two round pads and two long, curved claws at the end. The following joints of the legs are preserved: First pair: coxa, trochanter, femur, patella and tibia of both sides; femur 3.0 mm. long. Second pair: coxa. trochanter, femur of

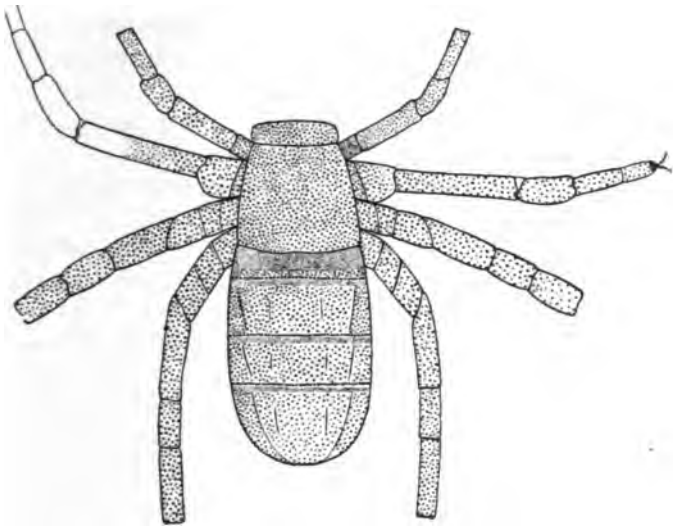

Fig. 44.

Figure 44.— *Polyochera punctulata* Scudder, holotype, U. S. N. M. No. 37971, dorsal surface. $\times \frac{8}{1}$

the left leg and a complete right leg; complete length 15.5 mm.; femur alone 5.5 mm. Third pair: coxa, two-jointed trochanter, femur, patella and tibia of both sides; femur 3.0 mm. long in middle line. Fourth leg: coxa, two-jointed trochanter, femur, patella and tibia of both sides; femur 3.7 mm. long in middle line.

"The front border of the cephalothorax is a little elevated, and behind it, extending nearly to the middle, a very broad, very shallow, transverse depression; there is also an equally slight but small central depression, but all of these scarcely affect the extreme flatness of the whole field which is shared also by the abdomen; both cephalothorax and abdomen are regularly and deeply punctate,

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excepting on the brief first (= third, A. P.) abdominal segment which is only punctate along its hinder edge" (Scudder, 1890, p. 444).

One pair of shorter, inner, and one pair of oblique, longer, outer lines divide the second, third and fourth visible tergites into five fields of which the middle one is the widest. Along the posterior edge of the first, second and third visible tergites runs a row of punctate depressions, much heavier than those covering the rest of the body and the legs.

The reverse of the specimen shows clearly that the cucullus was anteriorly bent downward, much as is the case in recent Ricunlei, and appears in form of a punctate, triangular plate. Behind it is an almost smooth transverse area, probably the coxae of the pedipalpi. The long and narrow coxae of the first pair of legs, and the triangular coxae of the second pair are almost smooth, those of the third and fourth pair punctate like the dorsal surface of the abdomen. Between the widely distant second coxae is visible a dark plate with a narrow anterior process separating the first coxae. This plate is probably the anterior part of the sternum, which is hidden posteriorly by the contiguous third and fourth coxae.

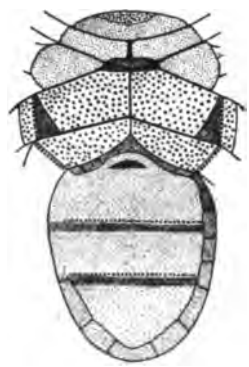

Fig. 45.

Figure 45.—Same, ventral surface, showing coxae and sternites. $\times \frac{3}{1}$

Only three abdominal sternites are visible, belonging to the fourth, fifth and sixth segments, with a row of deep round depressions along the posterior edge of the first and second visible sternite. Covering the edge of the abdominal sternites is the unsegmented pleura, the lines simulating segmentation evidently due to artificial folding.

A second specimen, in the collection of Mr. L. E. Daniels, is not so well preserved as the type, yet shows sufficiently clearly all structures as to leave no doubt of it belonging to the same species. The pleura in this specimen shows no artificial segmentation, but is folded longitudinally. Total length 12.5 mm. Width of abdomen 6.0 mm.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

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Polyochera glabra n. sp.

Plate VII, figs. 39, 40; text fig. 46.

U. S. National Museum No. 37981. Obverse shows the cucullus, cephalothorax, abdomen and part of what is probably the second and fourth leg. The reverse shows the somewhat deformed coxae of which only those of the third and fourth pair are sufficiently clear to show that they have the same arrangement as in *P. punctulata*, the abdomen with an entire, not segmented pleura and the fragments of the same legs.

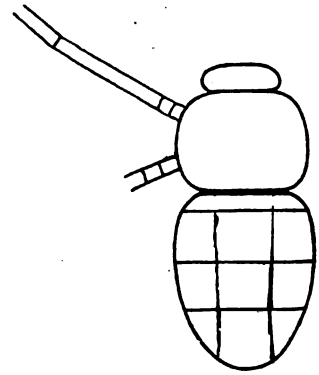

Fig. 46.

Figure 46.—*Polyochera glabra* n. sp., holotype, U. S. N. M. No. 37981, dorsal surface. $\times \frac{3}{1}$

Total length 13.8 mm. Cucullus 1.05 mm. long, 3.5 mm. wide. Cephalothorax 4.3 mm. long, 5.7 mm. wide, with rounded corners and striaght posterior and anterior edge. Between the oval abdomen and the cephalothorax is a deep groove. The tergites are divided into three fields by longitudinal ridges. Whole body smooth.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Holotergidae new family.

Abdomen covered with an entire shield, probably corresponding to the third to sixth segments.

Genus *Curculioides* Buckland 1837.

With the characters of the family.

Key to the Species of Curculoides.

1. Abdominal shield with a median longitudinal ridge *C. scaber*

\+ abdominal shield without a median ridge 2

2. Cephalothorax wider than long *C. sulcatus*

\+ cephalothorax as wide as long *C. ansticii*

Curculioides ansticii Buckland.

C. ansticii Buckland, Bridgewater Treatise (ed. 2), Vol. II, 1837, p. 76, pl. 46, fig. 1. Pocock, Carb. Arachn. 1911, p. 39, pl. II, fig. 7; text figs. 12, 13.

Found in the Coal Measures of Coseley, near Dudley, England.

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Curculioides scaber (Scudder).

Plate VII, figs. 36, 37; text figs. 47, 48.

= *Geratarbus scabrum* Scudder, Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 448, pl. 39, fig. 5.

The type and only specimen, No. 1765 a b of the Lacoe collection, is at present in the collection of the U. S. National Museum under the number 37965. Scudder has not sufficiently cleaned the specimen of the kaolin and some important structures have escaped his attention.

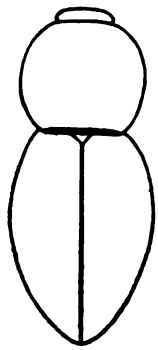

Fig. 47.

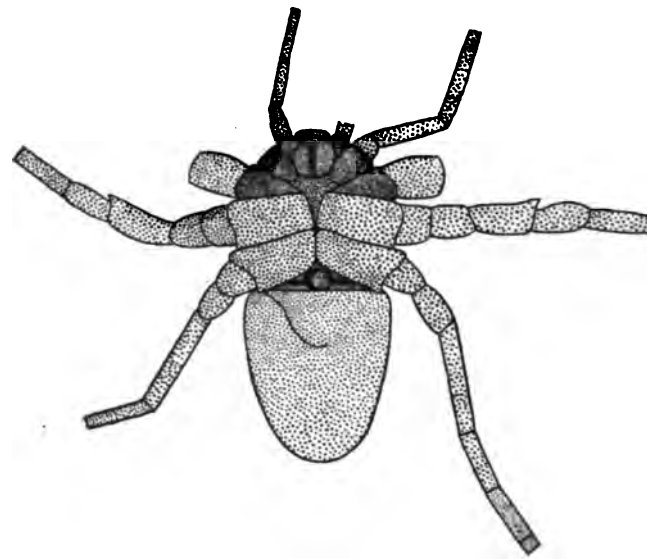

Fig. 48.

Figure 47.—*Curculioides scaber* (Scudder), holotype, U. S. N. M. No. 37965, dorsal surface. Figure 48.—Same, showing the whole specimen from the ventral side. $\times \frac{8}{1}$

Total length 15.0 mm. Cucullus 0.55 mm. long, 2.5 mm. wide. The reverse shows that the cucullus was bent downward as in recent Ricinulei, thus having two surfaces standing at right angles to each other. Cephalothorax 5.0 mm. long, 5.25 mm. wide in the middle, only 3.6 mm. wide at posterior edge, which is straight. The abdomen is oval, covered with one shield whith a longitudinal median ridge. In the specimen the left side of the abdomen is longitudinally folded, the fold being artificial, but the ridge is quite distinct. A heavy fold separates the abdomen from the cephalothorax. The whole

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dorsal surface is uniformly punctuate. The underside of the abdomen also uniformly punctate, has a procurved line, in front of which, in the triangle between the hind coxae, are two parallel ridges and a deep, hemispherical depression, probably the genital opening. All coxae well preserved. Those of the first and second pair widely separate, between them the sternum visible posteriorly as far as the posterior end of the third coxae. Fourth coxae contiguous. Immediately behind the ventral part of the cucullus is a large, almost round plate, divided longitudinally in two by a median ridge. It is possible that this plate represents the outer aspect of the chelicera. At the sides of this plate are the coxae of the pedipalpi. Four joints of the left pedipalp are visible, showing that the pedipalp was slender and that its trochanter is two-jointed. Of the first pair of legs, which were considerably thinner than the others and only little heavier than the pedipalpi, are preserved both coxae and the trochanter, femur, patella, tibia and metatarsus of the right leg. Of the second pair of legs only the coxae and trochanters are preserved. Like that of the first pair the trochanter is one-jointed, but extraordinarily large. The legs of the third and fourth pair are almost complete, missing are the metatarsi and tarsi. The femur of the first leg is short and stout with a sharp apical process. The fourth femur is slender and long, measuring 5.0 mm. The ventral surface is also uniformly punctuate with the exception, however, of the parts minutely dotted on text figure 48, which appear quite smooth.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Curculioides sulcatus (Melander).

Plate VII, fig. 38; text figs. 49, 50.

= *Kustarachne sulcata* Melander, Jour. Geol., Vol. XI, 1903, p. 181, pl. V, fig. 5, pl. VII, fig. 4.

The type and only specimen of this species, No. 9235, is in the collection of the Walker Museum of the University of Chicago. The nodule containing it consists both of the obverse and reverse, but the whole specimen was heavily covered with kaolin, this being the reason why Melander's description is quite incorrect. Basing his opinion on the similarity in the relative measurements of *Curculioides sulcatus* and *Kustarachne tenuipes*, Pocock suggests in his Monograph that "one shows the dorsal, and the other the ventral view of specimens belonging to the same species." This suggestion is excusable only in view of the fact that Pocock had no occasion to examine the specimens themselves and based his judgment on the incomplete and erroneous

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descriptions. The following description is drawn from the type specimen after it had been cleaned of the kaolin and the legs exposed as far as possible.

Total length 16.5 mm. Cucullus 1.15 mm. long, 3.0 mm. wide. Cephalothorax 4.25 mm. long, 6.0 mm. wide in posterior $^1/_3$, 5.25 mm. wide at posterior edge, which is straight. Abdomen with an entire shield, folded in median line but not with a median longitudinal ridge,

Fig. 49.

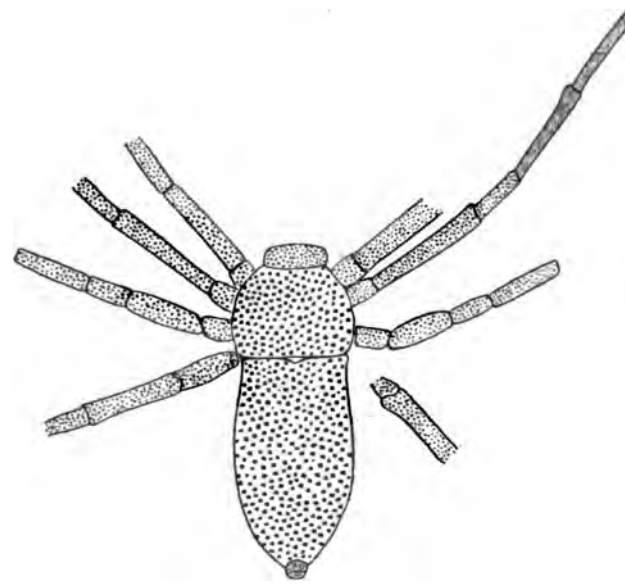

Fig. 50.

Figure 49.—*Curculioides sulcatus* (Melander), holotype, Univ. of Chicago Mus. No. 9235, ventral surface of abdomen. Figure 50.—Same, showing entire specimen from dorsal surface. $\times \frac{2.5}{1}$

folding being due to pressure. Behind the shield is visible a small segment representing probably the seventh to ninth segments. Legs very long and rather thin. The cucullus and legs minutely punctate, the cephalothorax and abdominal shield coarsely punctate. The tibia and metatarsus of the second leg and the terminal abdominal joint smooth.

The ventral surface is not sufficiently well preserved to show the arrangement of all coxae, but the third and fourth coxae are distinctly contiguous. In the anterior part of the abdomen there is a strongly procurved fold represented by the two lines in text figure 49.

Found in the Pennyslvanic (Lower Allegheny) of Mazon Creek, Illinois.

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ORDER ARANEAE

Head completely fused with thorax. Abdomen with pedicel, segmented in the lowest forms, in all higher forms unsegmented. Chelicera retroverte. Pedipalpi pediform, six-jointed, their coxa in higher forms with a maxillarly lobe. Legs seven-jointed, movably articulated to a sternum. Patella present in all legs and palpi. Trochanters all one-jointed. Spinning glands in the abdomen with numerous ducts opening on the spinnerets; spinnerets always on the abdomen, either in the middle of its ventral surface as in Liphistiidae, or at the end, immediately in front of the anus. Respiratory organs in form of two pairs of lungs in lower forms, or one pair of lungs and a pair of tracheal tubes, in higher forms; sometimes without lungs, but with two pairs of tracheal tubes, or with one pair of lungs, but without tracheal tubes. Spiracles in all cases on the ventral surface of the abdomen. Genital opening in both sexes on the ventral surface of the abdomen, not far from its anterior end. Sperm receptacles in the female either connected with the uterus, or blind, often with a complicated chitinous structure or epigynum. Organs of copulation in the male on the pedipalpi, the terminal joint of which is specially modified for this purpose. Usually eight eyes (sometimes six, four, two or none) in two or three rows on the cephalothorax. Morphologically they represent two groups: one pair of median eyes with direct retina and two groups of lateral eyes with inverted retina. All spiders are oviparous. They eat insects and other spiders. Their instincts are highly developed and manifold. Some have burrowing habits, others make snares, some are true vagabonds. With very few exceptions they lead terrestrial life, and those living under water or between the tides are not really aquatic, since they use air for breathing.

Key to the Sub-Orders of Araneae.

1. Abdomen segmented. Four pairs of spinnerets in the middle of the abdomen on its ventral surface
   Mesothelae
   \+ abdomen not segmented. Spinnerets immediately in front of the anus 2
2. Chelicera so articulated, that the fangs move parallel to the plane of symmetry of the animal. Two pairs of lungs
   Mygalomorphae
   \+ Chelicera so articulated, that the fangs move in a plane clearly intersecting the plane of symmetry. One pair of lungs and one

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pair of tracheal tubes, or tracheal tubes absent, or two pairs of tracheal tubes and no lungs

Arachnomorphae

LIST OF DESCRIBED SPECIES OF ARANEAE

Sub-Order Mesothelae.

Abdomen segmented. Four pairs of spinnerets in the middle of the abdomen on its ventral surface. Two pairs of lungs. Chelicera

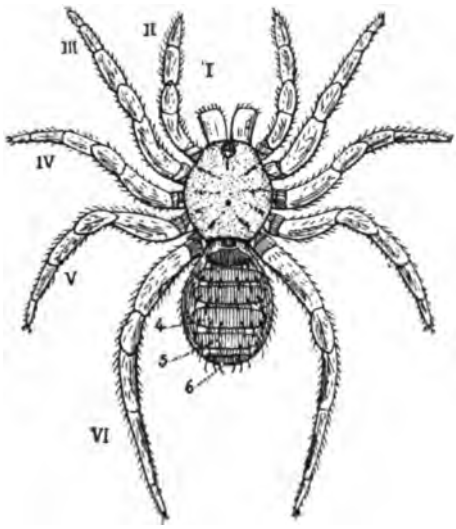

Fig. 51.

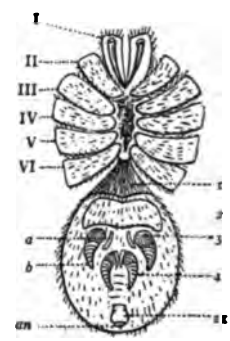

Fig. 52.

Figure 51. — *Liphistius desultor* Schiödte from Pinang; dorsal view. Figure 52. — Same, ventral surface. (From Encyclopaedia Britannica, 11th ed.)

so articulated that the fangs move in a plane parallel to the plane of symmetry.

Family Arthrolycosidae Fritsch.

Genus *Arthrolycosa* Harger.

Genotype A. antiqua Harger.

1. ***Arthrolycosa antiqua*** Harger, Amer. Jour. Sci., (3), Vol. VII, 1874, pp. 219—223. Beecher, Ibid., Vol. XXXVIII, 1889, p. 219—223, figs. 1—3.

   From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

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2. *Arthrolycosa danielsi* n. sp.
   From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

3. ?*Arthrolycosa* sp. Pocock, Carb. Arachn., 1911, p. 34, fig. 10.
   From the Coal Measures of Coseley, near Dudley, England.

Fritsch refers to the genus *Arthrolycosa* the following species from Bohemia, which according to Pocock " represent at least six genera and possibly as many families if the drawings are to be trusted."

1. *A. carbonaria* (Kuśta)
   = *Scudderia carbonaria* Kuśta, Sitz. k. k. Gesell. d. Wiss., 1888, p. 203.
   A. carbonaria Fritsch, Pal. Arachn., 1904, p. 6, pl. 1, fig. 1, fig. 2, text figs. 2, 3.

2. *A. fortis* Fritsch, loc. cit., p. 8, pl. 1, figs. 1, 2, text fig. 4.

3. *A. beecheri* Fritsch, loc. cit., p. 9, pl. 1, figs. 3–5, text fig. 5.

4. *A. lorenzi* (Kuśta)
   = *Eolycosa lorenzi* Kuśta, Sitz. k. k. Gesell. d. Wiss, 1885.
   A. lorenzi Fritsch, loc. cit., p. 10, pl. 2, figs. 2, 3; text fig. 6.

5. *A.* (?) *palaranea* (Fritsch)
   = *Palaranea borassifoliae* Fritsch, Archiv. f. Landesf. v. Böhmen, Vol. II, 1813, p. 8, pl. II, fig. 7.
   A. (?) *palaranea* Id., Pal. Arachn., 1904, p. 11, text fig. 7.

Genus *Protolycosa* F. Römer.

Genotype P. anthracophyla Römer.

1. *P. anthracophyla* Römer, Jahrb. f. Min., 1866, p. 136, pl. III. Fritsch, Pal. Arachn., 1904, p. 12, pl. 13, fig. 14; text figs. 8–10.
   From the Coal Measures of Upper Silesia, Germany.

Genus *Geralycosa* Kuśta.

Genotype G. fritschii Kuśta.

1. *G. fritschii* Kuśta, Sitz. k. k. Gesell. d. Wiss., 1888, p. 194, fig. 1. Fritsch, Pal. Arachn., 1904, p. 14, pl. 3, fig. 1; text figs. 11–13.
   From the Coal Measures of Rakonitz, Bohemia.

Genus *Rakovnicia* Kuśta.

Genotype R. antiqua Kuśta.

1. *R. antiqua* Kuśta, Sitz. k. k. Gesell. d. Wiss., 1884, p. 400, pl. I. fig. 3. Fritsch, Pal. Arachn., 1904, p. 15, pl. 2, fig. 4; text fig. 15,
   From the Coal Measures (Noegerathienschiefer) of Rakonitz, Bohemia.

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Genus *Perneria* Fritsch.

Genotype and only species

1. *P. salticoides* (Fritsch)
   = *Arthrolycosa salticoides* Fritsch, Fauna der Gaskokle, Vol. IV, 1901, pl. 153, fig. 10.
   P. salticoides Id., Pal. Arachn., 1904, p. 22, text fig. 27.
   From the Coal Measures of Nyřan, Bohemia.

Genus *Eocteniza* Pocock.

Genotype and only species

1. *E. silvicola* Pocock, Carb. Arachn., 1911, p. 34, pl. 34, fig. 4.
   From the Coal Measures of Coseley, near Dudley, England.

Sub-Order Arachnomorpha.

Genus *Eopholcus* Fritsch.

Genotype and only species

1. *E. pedatus* Fritsch, Pal. Arachn., 1904, p. 22, text fig. 28.
   From the Coal Measures of Nyřan, Bohemia.

Genus *Pyritaranea* Fritsch.

Genotype and only species

1. *P. tubifera* Fritsch, Fauna d. Gaskohle, Vol. IV, 1901, fig. 63.
   Id., Pal. Arachn., 1904, p. 25, text fig. 31.
   From the Coal Measures of Nyřan, Bohemia.

Genus *Archaeometa* Pocock.

Genotype and only species

1. *A. nephilina* Pocock, Carb. Arach., 1911, p. 37, text fig. 11.
   From the Coal Measures of Coseley, near Dudley, England.

DESCRIPTION OF NORTH AMERICAN CARBONIFEROUS ARANEAE

Sub-Order Mesothelae.

Genus *Arthrolycosa* Harger 1874.

New definition. Cephalothorax longer than wide. Eyes on a tubercle. Genotype *A. antique* Harger.

Key to Species of Arthrolycosa.

1. Femora of all legs shorter than cephalothorax. Eye tubercle not in line with outer edge of cephalothorax
   A. antiqua
   + femur of the first pair of legs almost as long as the cephalothorax, the other femora longer than cephalothorax. Eye tubercle touching anterior edge
   A. danielsi

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Arthrolycosa antiqua Harger.

Plate VIII, figs. 43, 44; text figs. 53, 54.

A. antiqua Harger, Amer. Jour. Sci., (3), Vol. VII, 1874, pp. 219–223. Scudder, Proc. Amer. Acad. Arts Sci., 1884, p. 15. Beecher, Amer. Jour. Sci., (3), Vol. XXXVIII, 1889, pp. 219–223, text figs. 1–3.

Type specimen No. 161, Peabody Museum. The description of this specimen given by Beecher in his excellent paper in 1889, while

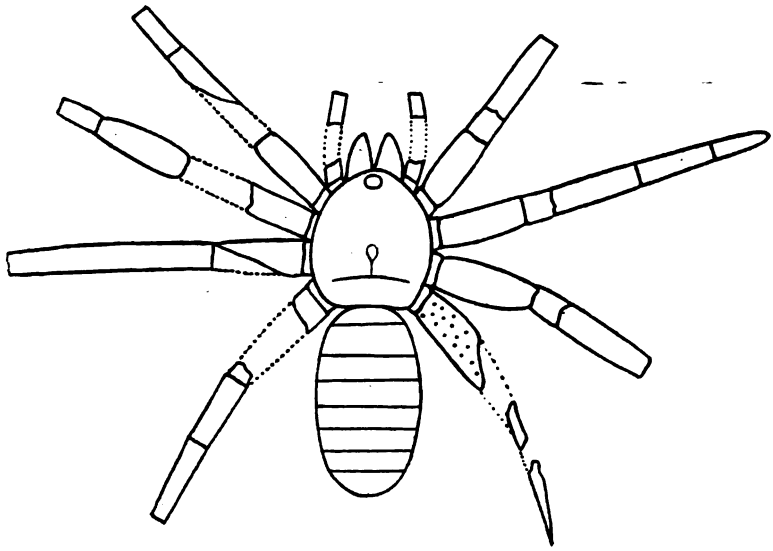

Fig. 53.

Figure 53.—*Arthrolycosa antiqua* Harger, holotype, Peabody Mus. No. 161, showing dorsal surface after the abdomen has been all exposed. × $\frac{2}{1}$

it has considerably advanced our knowledge of the spider is incorrect in some regards, since the specimen was not entirely exposed. Thus he failed to notice that the terminal joints of the palpi are altogether missing and that the abdomen is larger than it appears on his drawing. I have carefully cleaned the entire nodule and am able to say that the specimen is now completely exposed and appears as drawn in my text figure 53, the dotted parts and the terminal joints of the palpi and legs actually missing. The obverse alone shows the spider. The reverse shows only fractions of legs, but no body.

Total length without mandibles 22.0 mm. Cephalothorax 9.0 mm. long, 8.0 mm. wide in the middle. All femora shorter than cephalothorax.

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The cephalothorax is rounded anteriorly, the posterior edge almost straight. A deep, oval depression somewhat behind the middle of the cephalothorax, and behind the depression a transverse ridge. Eye tubercle transversely ellipsoidal, high, eyes not preserved. Abdomen composed of eight segments, oval, its right side somewhat pressed out of shape and lower than the rest, yet clearly showing segmentation. Since the spinnerets were probably on the ventral surface as in *Liphistius*, the number of visible segments may not be

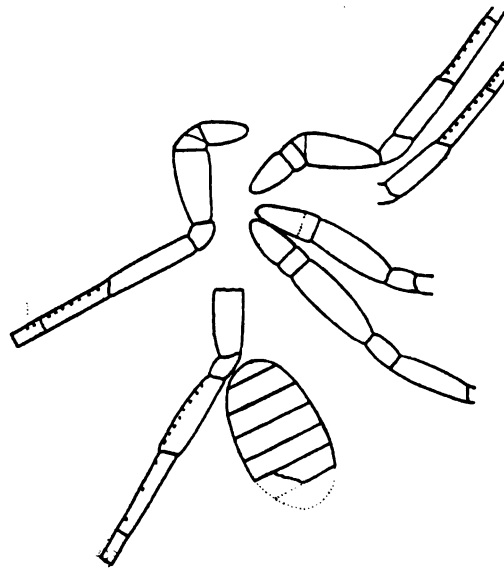

Fig. 54.

Figure 54.—*Arthrolycosa antiqua* Harger. No. 163, Peabody Museum, showing the specimen as it appears on the nodule. × $\frac{1.6}{1}$

the true number. Mandibles strong, conical, the fang not visible. Pedipalpi slender, their terminal joints missing. Legs heavy and long. but only the right leg of the second pair complete. Femur 5.7 mm. long, patella and tibia 9.5 mm. metatarsus 5.0 mm., tarsus 3.7 mm, Fourth femur punctate.

It must be added that the specimen presents its actual dorsal surface and not a mould of it, as is evident from the appearance of the eye tubercle and oval dorsal depression.

Specimen No. 162 of the Peabody Museum (Plate VIII, fig. 43). Like the type specimen, the dorsal surface is not a mould, but the actual surface of the spider. Total length 14 mm. Cephalothorax 6.2 mm. long, the side margins obliterated so that the width cannot be

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ascertained. The thoracic part is rather flat, but the cephalic part elevated, highest at the eye tubercle, gradually sloping laterally and posteriorly to the oval depression. Abdomen flat, oval, 6.0 mm. wide in the middle. The segmentation not as clear as in the type specimen, the lines being rather faint. Chelicera heavy and long. Of the legs and palpi only fragments preserved.

Specimen No. 163, Peabody Museum. Text fig. 54.

A badly crushed specimen, probably belonging to this species. Only part of the abdomen, four right and two left legs preserved. The abdomen is oval, six segments can be counted, the lines between the segments quite distinct. First leg almost complete. Femur 6.5 mm. long, patella and tibia 9.3 mm., metatarsus 6.5 mm. with a row of seven round depressions. Second leg: tibia alone 6.0 mm., metatarsus 6.03 mm., tarsus 2.8 mm. Both metatarsus and tarsus with a row of round depressions of which the metatarsus has seven and the tarsus four. Third leg: femur 7.3 mm. Fourth leg: femur 8.5 mm., patella + tibia 10.0 mm., metatarsus 8.0 mm. The tibia of the leg close to the abdomen (probably the fourth left leg) has a row of eight round depressions.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Arthrolycosa danielsi n. sp.

Plate VIII, figs. 45, 46; text figs. 55, 56.

The type and only specimen of this species is in the collection of Mr. L. E. Daniels. It is much better preserved than either of the three specimens of the preceding species. Total length, without mandibles, 14.5 mm. Cephalothorax flat, 5.6 mm. long, 5.0 mm. wide in posterior $^1/_3$, oval, with recurved posterior margin. Two small tubercles in the middle of the cephalothorax, and radiating from them four pairs of ridges. The transversely ellipsoidal depression, the mould of the eye tubercle, touching the anterior margin. In it are two pairs of oval depressions, moulds of the eye lenses. Abdomen shows clearly six segments but, as in the preceding species, the true number of abdominal segments was probably greater. Small, round, punctate depressions probably mark the attachment places of the dorso-ventral muscles. The chelicera strong, angular, prismatic with a thickened inner edge. Of the pedipalpi only the coxae and trochanters preserved, but it is impossible to say whether the coxae had a maxillary lobe. Legs all in position, but all joints beyond the femur missing. Coxae of first and second pair triangular. Trochanter

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typical, one-jointed. First femur 5.2 mm. long, second 6.1 mm., third 6.9 mm., fourth 6.1 mm.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

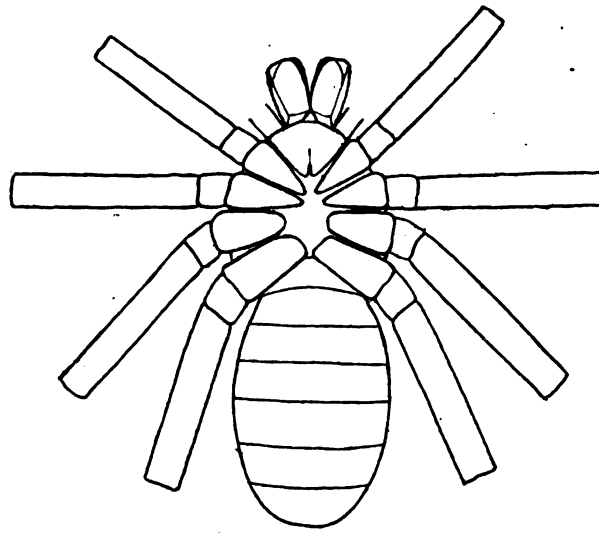

Fig. 55.

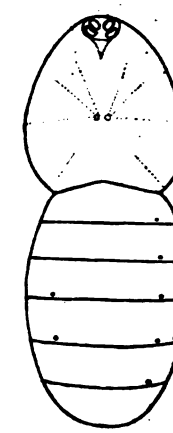

Fig. 56.

Figure 55.—*Arthrolycosa danielsi* n. sp., holotype, Daniels coll., showing the ventral surface of the specimen as it appears on the nodule. Figure 56.—Same, showing dorsal view of the body. $\times \frac{3.5}{1}$

ORDER ANTHRACOMARTI

Head completely fused with thorax. Abdomen segmented, the anal operculum representing probably the eleventh abdominal segment. Dorsal surface of abdomen divided into three or five longitudinal areas, the central one formed by the tergites, the lateral ones by the pleural sclerites. Chelicera not known. Pedipalpi pediform. Legs seven-jointed, with movable coxae, apparently articulated to a sternum.

Pocock, who made a careful study of this oder and has had more species before him than are known to occur in North America, describes the morphology of the abdomen in his Monograph as follows:

" Opisthosoma without appendages, movably jointed to the prosoma, but with its individual segme ts apparently welded together, though the sutural lines persist. Seven tergal plates are always

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traceable on the dorsal side, the first of the seven (*i. e.* thc seventh counting forwards from the posterior end) being almost invariably longer than those that succeed it; each tergum is marked on each side with a longitudinal sulcus or groove which separates a lateral lamina from the median area of the tergum; sometimes there is a second sulcus nearer the external margin than the one just mentioned; hence each tergum is divided into either three or five distinct areas according to the number of sulci. In front of the seventh tergum from the end, either one ot more tergal sclerites may be traced; these are usually not provided with lateral laminae and may be overlapped more or less by the posterior border of the carapace; they appear to represent from one to three additional tergal plates undergoing excalation, The last tergal plate on the dorsal side, that is to say the seventh, not counting the variable number of anterior tergal plates just mentioned, is the narrowest of the series; but it is almost invariably provided with an unpaired posteriorly-expanding median lamina, in addition to its paired laminae, with which it forms a continuous series; this lamina is itself sometimes marked off by a transverse sulcus from the median area of the tergum. This median lamina of the last tergum visible from the dorsal side, overlaps the tergal element of the next succeeding segment; the tergum of this segment is fused with its sternal element to constitute a subannuliform sclerite, near the center of which lies a plate, the anal operculum, which is the tergal element of the last segment. Thus ten tergal elements may be traced with certainly in almost all genera, the last being the anal operculum and the first the short tergal area that lies between the carapace and the first large tergal plate of invariable occurrence, namely the seventh from the end on the dorsal side.

"The sternal elements of the opisthosoma appear to correspond in number with the terga, except that, with the doubtful exception of *Eophrynus*, there is no sternal plate to represent the tenth tergum or anal operculum. Hence there are nine sternal plates in all, the last being the ventral element of the plate surrounding the anal operculum. The anterior sterna are variously modified and arranged according to the genus, the arrangement in *Anthracomartus* being very different from that of *Eophrynus*, the first, whether large as in the former or small as in the latter, being probably the genital operculum."

Not having sufficient material to make a study of the morphology of the abdomen in Anthracomarti, I am not able to either accept or criticize Pocock's interpretation. One point, however, I cannot leave without mention. If Pocock's interpretation is correct and

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the anal operculum normally appearing on the ventral surface of the specimen represents the tergite of the last abdominal segment, then the anal operculum is the tergite of the eleventh and not of the tenth segment. This is clear from Pocock's own text figures 29–31 and his assertion that in front of the first large tergite is at least one segment partly covered by the cephalothorax.

Pocock recognized four families of Anthracomarti, basing his classification on the shape of the pleural laminae and the presence of a transverse sulcus on the cephalothorax. Neither of these characters has in my opinion the value of a family character. We find in the order of recent spiders widely different chitinized structures of the abdomen in species belonging to the same genus and even in the two sexes of the same species. A much better character seems to be the number of pleural sclerites. I therefore recognize only two families.

The order of Anthracomarti consists entirely of extinct forms.

Key to the Families of Anthracomarti.

1. Pleural laminae subdivided — Anthracomartidae (= Anthracomartidae + Brachypygidae Pocock)
   + pleural laminea entire — Eophrynidae (= Eophrynidae + Anthracosironidae Pocock)

LIST OF DESCRIBED SPECIES OF ANTHRACOMARTI.

Family Anthracomartidae.

Genus *Anthracomartus* Karsch.

Genotype—A. voelkelianus Karsch.

1. *A. voelkelianus* Karsch, Zeits. deutsch. geol. Gesell., Vol. XXXIV, 1882, p. 556. Haase, Beitrag z. Kenntniss d. foss. Arachn., Ibid., Vol. XLII, 1890, p. 645, pl. XXX, figs. 8, 9. Fritsch, Pal. Arachn. 1904, p. 40, text fig. 47.
   From the Coal Measures of Silesia, Germany.
2. *A. granulatus* Fritsch, loc. cit., p. 40, text fig. 48.
   From the Coal Measures of Silesia, Germany.
3. *A. palatinus* Ammon, Geogn. Jahresb., Vol. XIII, 1900, figs. 1–4. Fritsch, Pal. Arachn., 1904, p. 41, text fig. 50.
   From the Coal Measures of Palatinate (Pfalz), Germany.
4. *A. krejcii* Kusta, Sitz. k. b. Gesell. d. Wiss., 1883, p. 340, pl. I.
   ? = *A. affinis* Id., Ibid., 1885.

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A. krejcii Fritsch, Pal. Arachn., 1904, p. 36, pl. 4, fig. 1, text figs. 40, 41; p. 39, pl. 3, fig. 1; pl. 4, fig. 7; text fig. 45.

From the Coal Measures (Noegerathienschiefer) of Rakonitz, Bohemia.

5. *A. minor* Kusta, Sitz. k. b. Gesell. d. Wiss., 1885, p. 3, pl. fig. 1. ? = *A. socius* Id., Ibid., 1888, p. 203, pl. fig. 4.

A. minor Fritsch, Pal. Arachn., 1904, p. 38, pl. 4, figs. 4–7, text figs. 42–44; p. 39, text fig. 46.

From the Coal Measures (Noegerathienschiefer) of Rakonitz, Bohemia.

6. *A. bohemicus* (Fritsch).

= *Promygale bohemica* Fritsch, Fauna d. Gaskohle, Vol. IV, 1901, p. 58, pl. 153, figs. 6–8; pl. 154, fig. 1. Id., Pal. Arachn., 1904, p. 19, pl. 15, fig. 1, text fig. 20–22.

From the Carboniferous (Secundakohle) of Nyran, Bohemia.

7. *A. elegans* (Fritsch)

= *Promygale elegans* Fritsch, Fauna d. Gaskohle, Vol. IV, 1901, p. 61, text fig. 365. Id., Pal. Arachn., 1904, p. 21, pl. 15, figs. 2–4 text fig. 26.

From the Carboniferous (Gaskohle) of Nyran, Bohemia.

8. *A. hindi* Pocock, Carb. Arachn., 1911, p. 64, pl. III, fig. 3, text figs. 30–32.

From the Coal Measures of Coseley and Dudley, England.

9. *A. priesti* Pocock, loc. cit., p. 67, text figs. 33, 34.

From the Coal Measures of Coseley and Dudley, England.

10. *A. trilobitus* Scudder, Proc. Amer. Acad. Arts Sci., Vol. XX, 1884, p. 17. Id., C. R. Soc. Ent. Belg., (3), 1885, p 85. Id. Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 451, pl. 39, figs. 7–10.

From the Pennsylvanic (Up. Pittsville) of Fayetteville, Arkansas.

11. *A. triangularis* n. sp.

From the Joggins Mines, Nova Scotia.

Genus *Brachypyge* H. Woodward 1878.

Genotype and only species

1. *B. carbonis* Woodward, Geol. Mag., (2), Vol. V, 1878, pp. 433–436, pl. XI. Fritsch, Pal. Arachn., 1904, p. 42, text fig. 52. Pocock, Carb. Arachn., 1911, p. 59, text fig. 28.

From the Coal Measures of Mons, Belgium.

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Genus *Maiocercus* Pocock 1911.

Genotype and only species

1. *M. celticus* (Pocock)
= *Eophrynus carbonis* Howard and Thomas, Cardiff Nat. Hist. Soc., Vol. XXVIII, 1896, p. 52, figs. a, b.
= *Brachypyge celtica* Pocock, Geol. Mag., (4), Vol. IX, 1902, p. 488, fig. 2a. Fritsch, Pal. Arachn., 1904, p. 41, text fig. 51.
M. celticus Pocock, Carb. Arachn., 1911, p. 60, text fig. 29.
From the Coal Measures of Ty'nybedw, Rhondda Valley, South Wales.

Genus *Eotrogulus* Thevenin 1901.

Genotype and only species

1. *E. fayoli* Thevenin, Bull. Soc. France, 1901, p. 607. Fritsch, Pal. Arachn., 1904, p. 43, text fig. 55.
From the Coal Measures of Commentry, France.

Famlly Eophrynidae.

Genus *Anthracosiro* Pocock 1903.

Genotype *A. woodwardi* Pocock.

1. *A. woodwardi* Pocock, Geol. Mag., (4), Vol. X, 1903, pp. 246–250, 405–408.
= *A. latipes* Gill, Nat. Hist. Soc. Northumb., Durham, Vol. III, 1909, pp. 510–522, pl. XIII.
A. woodwardi Fritsch, Pal. Arachn., 1904, p. 43, text fig. 53. Pocock, Carb. Arachn. 1911, p. 70, text figs. 35, 36.
From the Coal Measures of Coseley, Sparth and Crowcook, England.
2. *A. fritschi* Pocock, Geol. Mag., (4), Vol. X, 1903, pp. 405–408, fig. Fritsch, Pal. Arachn., 1904, p. 43, text fig. 54. Pocock, Carb. Arachn., 1911, p. 73, text fig. 37.
From the Coal Measures of Coseley, near Dudley, England.

Genus *Pleurolycosa* Fritsch 1904.

Genotype and only species

1. *P. prolifera* (Fritsch)
= *Arthrolycosa prolifera* Fritsch, Fauna d. Gaskohle, Vol. IV, 1901, p. 61, pl. 153, figs. 1, 3.
P. prolifera Id., Pal. Arachn., 1904, p. 23, text fig. 29.
(Position of both genus and species uncertain).
From the Coal Measures (Gaskohle) of Bohemia.

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Genus *Brachylycosa* Fritsch 1901.

Genotype and only species

1. *B. carcionides* (Fritsch)

= *Arthrolycosa carcinoides* Fritsch, Fauna d. Gaskohle, Vol. IV, 1901, p. 62, text fig. 367.

B. carcinoides Id., Pal. Arachn., 1904, p. 24, fig. 30.

(Position of both genus and species uncertain).

From the Coal Measures (Gaskohle) of Nyřan, Bohemia.

Genus *Hemiphrynus* Fritsch 1901.

Genotype—H. longipes Fritsch

1. *H. longipes* Fritsch, Fauna d. Gaskohle, Vol. IV, 1901, p. 57. Id., Pal. Arachn., 1904, p. 17, text fig. 17.

From the Coal Measures (Gaskohle) of Nyřan, Bohemia.

2. *H. hofmanni* Fritsch, Fauna d. Gaskohle, Vol. IV, 1901, p. 58. Id., Pal. Arachn., 1904, p. 18, text figs. 18, 19.

From the Coal Measures (Gaskohle) of Bohemia.

Genus *Vratislavia* Fritsch 1904.

Genotype and only species

1. *V. silesiaca* (F. Römer)

= *Architarbus silesiacus* F. Römer, Jahresb. schles. Gesell. Breslau 1878, pp. 54–55.

V. silesiaca Fritsch, Pal. Arachn., 1904, p. 44, pl. 13, figs. 5, 6, text fig. 56.

From the Coal Measures near Glatz, Silesia, Germany.

Genus *Eophrynus* Woodward 1871.

Genotype and only species

1. *E. prestvici* (Buckland)

= *Curculiodes prestvici* Buckland, Bridgewater Treatise (2d ed.), Vol. II, 1837, p. 76.

E. prestvici Woodward, Geol. Mag., (2), Vol. VIII, 1871, p. 86, pl. XI. Fritsch, Pal. Arachn., 1904, p. 46, pl. 14, figs. 3, 4, text figs. 57–60. Pocock, Carb. Arachn., 1911, p. 77, text fig. 339.

From the Coal Measures of Shropshire and Coseley, England.

Genus *Stenotrogulus* Fritsch 1904.

Genotype and only species

1. *S. salmii* (Stur)

= *Eophrynus salmii* Stur, Die Culmflora, 1877, p. V, text fig.

S. salmii Fritsch, Pal. Arachn., 1904, p. 48, pl. 14, fig. 2, text fig. 62.

From the Coal Measures of Mährisch Ostrau, Silesia, Germany.

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Genus *Cyclotrogulus* Fritsch 1904.

Genotype and only species

1. *C. sturii* (Haase)
   = *Eophrynus sturii* Haase, Beiträge z. Kenntniss d. foss. Arachn., 1890, p. 642.
   C. sturii Fritsch, Pal. Arachn., 1904, p. 49, pl. 14, fig. 1.
   From the Coal Measures of Mährisch Ostrau, Silesia, Germany.

Genus *Kreischeria* Geinitz 1882.

Genotype *K. wiedei* Geinitz.

1. *K. wiedei* Geinitz, Zeits. d. geol. Gesell., Vol. XXXIV, 1882, p. 238, pl. XIV. Haase, Ibid., Vol. XLII, 1890, p. 642, pl. XXX, fig. 6. Fritsch, Pal. Arachn., 1904, p. 50, text figs. 63, 64.
   From the Coal Measures (Sigillaria zone) of Zwickau, Germany.
2. *K. verrucosa* Pocock, Carb. Arachn., 1911, p. 78, text fig. 40, pl. III, fig. 5.
   From the Coal Measures of South Wales.

Genus *Hemikreischeria* Fritsch 1904.

Genotype and only species

1. *H. geinitzi* (Thevenin)
   = *Kreischeria geinitzi* Thevenin, Proc. Verb. Soc. d'Hist. Nat. d'Autun, Vol. XV, 1902, p. 195.
   = *H. thevenini* Fritsch, Pal. Arachn., 1904, p. 51, text figs. 65 A.—C.
   From the Coal Measures (Westphalian) of Valenciennes, France.

Genus *Petrovicia* Fritsch 1904.

Genotype and only species

1. *P. proditoria* Fritsch
   = *Eophrynus* n. sp. Kuśta, Sitz. k. b. Gesell. Wiss., 1885, p. 7.
   = *Anthracomartus* sp. Id., Ibid., 1888, p. 207.
   P. proditoria Fritsch, Pal. Arachn., 1904, p. 52, pl. 5, figs. 1, 2, text figs. 66 A, B; 67, 68.

Genus *Adelocaris* Packard 1889.

Genotype and only species

1. *A. peruvianus* Packard, Proc. Boston Soc. Nat. Hist., 1889, p. 209. (Position of genus very doubtful).
   From Peru.

Genus *Trigonotarbus* Pocock 1911.

Genotype *T. johnsoni* Pocock.

1. *T. johnsoni* Pocock, Carb. Arachn., 1911, p. 74, pl. III, fig. 4, text fig. 38.
   From the Coal Measures of Coseley, near Dudley, England.

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2. *T. schucherti* n. sp.
   From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.
3. *T. carbonarius* n. sp.
   From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Genus *Aphantomartus* Pocock 1911.

Genotype and only species

1. *A. areolatus* Pocock, Carb. Arachn., 1911, p. 81, pl. III, fig. 6, text fig. 41.
   From the Coal Measures of South Wales.

Areomartus new genus

Genotype and only species

1. *A. ovatus* n. sp.
   From the Carboniferous of Fayette Co., West Virginia.

Trigonomartus n. gen.

Genotype and only species

1. *T. pustulatus* (Scudder)
   = *Anthracomartus pustulatus* Scudder, Proc. Amer. Acad. Arts Sci., Vol. XX, 1884, p. 18. Id., Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 452, pl. 40, figs. 5, 8.
   From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

It is probable that the arachnid from Bohemia, described by Fritsch under the name of *Promygale rotundata* (Pal. Arachn., 1904, p. 20, text figs. 23–25) also belongs to the family Eophrynidae of this order.

DESCRIPTION OF NORTH AMERICAN CARBONIFEROUS ANTHRACOMARTI

Family Anthracomartidae.

Genus *Anthracomartus* Karsch (Pocock 1911).

Pleural laminae divided, not emarginate. Abdomen rounded. Pedipalpi pediform. Genotype *A. voelkelianus* Karsch.

Key to North American Species of Anthracomartus.

1. Cephalothorax almost rectangular, wider than long — *A. trilobitus*
   + Cephalothorax triangular — *A. triangularis*

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Anthracomartus trilobitus Scudder.

Plate XI, fig. 60, text fig. 57.

A. trilobitus Scudder, Proc. Amer. Acad. Arts Sci., Vol. XX, 1884, p. 17. Id., C. R. Soc. Ent. Belgique, (3), 1885, p. 85, with fig. Id., Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 451, pl. 39, figs. 7—10.

Altogether twenty-two specimens, all from the same locality. Of these eighteen in the U. S. National Museum and four, including the type, No. 136, in the Museum of Comparative Zoology at Harvard University. None of the specimens shows either the ventral surface or legs, so that our knowledge of the species is based entirely on the characters of the cephalothorax and the dorsal surface of the abdomen. All are on dark grey carbonaceous shale, together with ferns. Although their size differs, all specimens have the same structure and same proportions. All appear punctate or granulate. As for the anal operculum, it must be stated that it is missing in some of the specimens and present in others, thus giving confirmation to the assumption, that it was pressed through the body from the ventral to the dorsal surface. The posterior edge of the cephalothorax is always strongly procurved. Behind it is the first abdominal tergite, partly covered by the cephalothorax and devoid of pleural laminae. The anal operculum appears perfectly round, imprinted on the eighth abdominal tergite. Measurements of type specimen: cephalothorax, 5.25 mm. long; 7.5 mm. wide; total length, 15.0 mm.

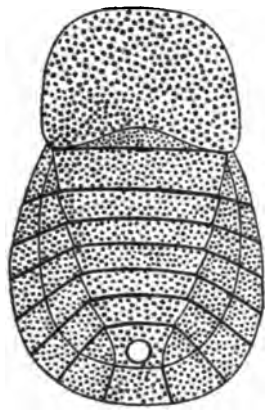

Fig. 57.

Figure 57.—*Anthracomartus trilobitus* Scudder, from the Pennsylvanic (Upper Pottsville) near Fayetteville, Arkansas, U. S. N. M. No. 1753d (Lacoe collection). $\times \frac{4}{1}$

Specimen No. 1753 d of the Lacoe collection in the U. S. National Museum. Length of cephalothorax in median line, 4.0 mm.; width, 6.5 mm. Length of abdomen in median line, 9.3 mm.; width in the region of the sixth tergite, 8,3 mm.

Found in the Upper Pottsville series, near Fayetteville, Washington County, Arkansas.

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Anthracomartus triangularis n. sp.

Plate XI, fig. 61; text fig. 58.

The type and only specimen of this species, No. 37968 of the U. S. National Museum, shows like the preceding species only the dorsal surface on the obverse and its mould on the reverse. The specimen is black, but in some places the black color is gone so that it appears mottled with yellow. On the same rock are impressions of ferns. The body is much flatter than in *A. trilobitus*. Total size 18.6 mm. Cephalothorax distinctly triangular, 6.5 mm. long, 7.5 mm. wide at posterior edge. Maximum width of abdomen 11.3 mm. Lines of separation heavy, black. The first tergite completely covered by the cephalothorax. An interesting feature represents the shape of the seventh and eighth (sixth and seventh visible) tergites.

Found in the Upper Coal Measures of Joggins Mines, Nova Scotia.

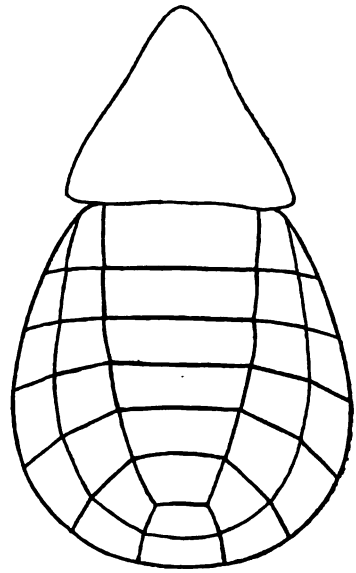

Fig. 58.

Figure 58.—*Anthracomartus triangularis* n. sp., from the Upper Coal Measures, Joggins Mines, Nova Scotia, holotype, U. S. N. M. No. 37968, dorsal surface. × $\frac{4}{1}$

Family Eophrynidae.

Key to North American Genera of Eophrynidae.

1. Cephalothorax triangular, elevated in the middle, sloping gradually in all directions, not sculptured *Trigonotarbus* Pocock
   + Cephalothorax sculptured 2
2. Cephalothorax triangnlar, wider than long, its surface divided into hexagonal fields. Abdominal tergites 9 *Areomartus* n. gen.
   + Cephalothorax triangular, longer than wide, with a median longitudinal crest in its posterior half. Abdominal tergites 8 *Trigonomartus* n. gen.

Areomartus n. gen.

With the characters given in the key. Genotype *A. ovatus* n. sp.

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Areomartus ovatus n. sp.

Plate X, fig. 58; text fig. 59.

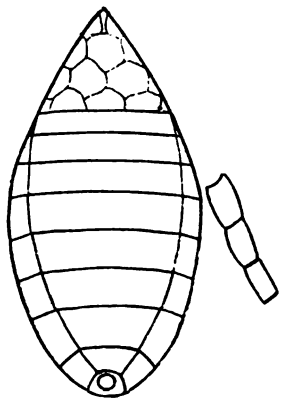

Fig. 59.

Figure 59. — *Areomartus ovatus* n. sp., from the Pennsylvanic(Lower Kanawha), Cottonhill, West Virginia, holotype, U. S. N. M. No. 1196, showing the dorsal surface. × $\frac{5}{1}$

The type and only specimen of this species is in the U. S. National Museum under No. 1196. Only the obverse is in existence and that shows the cephalothorax with abdomen and three joints of one leg.

Total length 9.75 mm. Cephalothorax remarkably small for the size of the abdomen, 2.5 mm. long, 3.25 mm. wide, beautifully triangular with scarcely curved margins and the surface divided into hexagonal areas which appear as slight depressions. Pleurae entire. Nine tergites can be counted with the anal operculum impressed on the ninth. The fragment of the leg, which probably belonged to the fourth pair, shows that the legs were short and stout.

Found in the Pennsylvanic (lower Kanawha), Cotton Hill, Fayette County, West Virginia.

Trigonomartus n. gen.

Cephalothorax triangular with a median crest in the posterior half, covered with irregular polygonal depressions. Visible abdominal tergites eight. Sternum very large. Posterior coxae by far the heaviest and much closer together than the preceding pair. Eyes absent. Genotype *T. pustulatus* (Scudder).

Trigonomartus pustulatus (Scudder)

Plate IX, figs. 47–51; text figs. 60–62.

= *Anthracomartus pustulatus* Scudder, Proc. Amer. Acad. Arts Sci., Vol. XX, 1884, p. 18. Id., Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 452, pl. 40, figs. 5, 8.

This species is represented by three excellently preserved specimens. The holotype, No. 1752 of the Lacoe collection, is in the U. S. National Museum under No. 37984. The second specimen

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is in the Peabody Museum, No. 168, and is from Bucks cral pit at Marris, Illinois. The third and best is in the collection of Mr. L. E. Daniels. All specimens are from the same region, are almost of the same size and agree completely in the details of structure.

Type specimen, Plate IX, figs. 47, 48. Total length 15.0 mm. Cephalothorax, length 6.0 mm.; it is somewhat pressed out of shape and the width given by Scudder as 7.0 mm. is excessive.

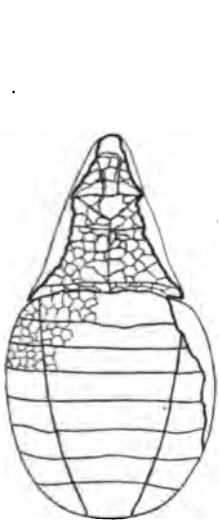

Fig. 60.

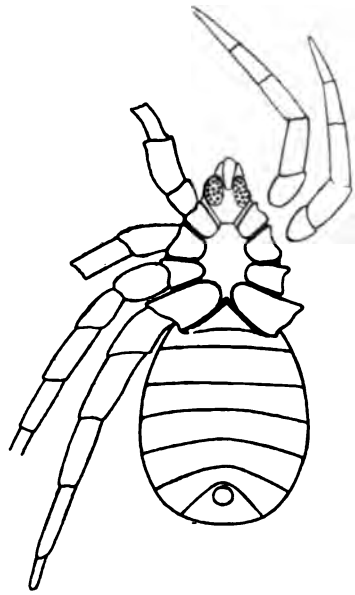

Fig. 61.

Fig. 62.

Figure 60.—*Trigonomartus pustulatus* (Scudder), specimen in the collection of Mr. L. E. Daniels, dorsal view of body. Figure 61.—Same, reverse, showing the whole specimen as it appears on the nodule. $\times \frac{3}{1}$. Figure 62.—Hind leg of the specimen from the Pennsylvanic, Morris, Illinois, Peabody Museum No. 168. $\times \frac{6}{1}$

Specimen in the Peabody Museum, No. 168. Total length 16.3 mm. Of interest is the right hind leg represented in text figure 62. It is preserved not as a mould, but is actually the petrified limb. Lying on the side, it shows the shape and thickness of the coxa, represented by the inner fine lines on the figure. The trochanter has an unusual shape, its dorsal surface being much longer than the ventral one, o that this joint is articulated with the femur in a manner similar

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to the patella of spiders, with this difference, however, that it is the distal end of the trochanter.

Specimen in the Daniels collection. Plate IX, figs. 49, 50; text figs. 60, 61. Total length 16.5 mm. Cephalothorax 7.0 mm. long, its probable width 5.1 mm. It has a distinct triangular shape, and together with the abdomen and lims, represents the *mould* of the actual specimen. This interpretation may seem strange to one who examines the obverse alone, since the specimen on the obverse stands out bodily to a considerable height and gives the impression of a petrified specimen. But a comparison with the reverse of the same specimen shows at once what has happened to this as to the other two specimens. Under pressure of the drying mud the dorsal surface of the abdomen of the specimen caught in it was pressed in until it became concave instead of remaining convex, coming in contact with the ventral surface. Why this happened to the dorsal surface and not to the ventral one, is not clear, but presumably the dorsal surface was less chitinized and therefore softer. The cephalothorax being much harder, kept more or less its shape, and what appears on it as the median crest was in reality a deep groove. The irregular, polygonal depressions appearing as such both on the abdomen and cephalothorax were evidently thickened areas of the chitin and formed in life low elevations. The abdomen covers in the specimen the posterior edge of the cephalothorax. Consequently we may assume that it had in life a segment anterior to the first visible tergite, consequently, if the anal operculum represents the last tergite the abdomen must have been composed of eleven segments as in *Anthracomartus*. The plate surrounding the anal operculum represents the fused tergite and sternite of the tenth segment and since in front of this plate may be counted only seven sternites, the first visible sternite which has the shape of a triangle correponds to the first, second and third abdominal segments. The dorsal surface of the abdomen was a little displaced laterally and shows on the left the sternites. Bearing all this in mind we may give the following description of the specimen as it must have appeared in life.

Cephalothorax triangular, high, covered with irregular polygonal thickenings. A deep transverse groove in the middle, another a little in front of it and a third close to the posterior margin which is covered by the abdomen. Two almost parallel grooves run from the anterior t ansverse groove to the anterior end of the cephalothorax. Two oblique ridges run from the sides of the anterior groove backward uniting a little in front of the median transverse

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groove. A median longitudinal groove runs from this point backward to the posterior margin. Eyes absent. Abdomen sphaeroidal, longer than wide, and wider than high, with the anal operculum placed ventrally and surrounded by a plate composed of the fused tergite and sternite of the tenth segment. Dorsal surface of abdomen covered with irregular polygonal thickenings similar to those of the cephalothorax, ventral surface smooth. Two deep grooves separate the tergites from the sclerites of the pleura in all segments except the tenth and eleventh and probably the first.

Ther sternum is very large, being 3.3 mm. long and 2.4 mm. wide between the coxae of the second and third pair of legs. It is truncated in front, has tree pairs of lateral projections and a posterior bifid lobe. Legs robust and moderately long, patella completely fused with tibia, tarsi longer than metatarsi. Length of legs in order 4312.

Two structures visible on the reverse require special mention. They are: a beak-like median process directed backward, and two oval deeply punctate areas. The first may be the end of the cephalothorax turned downward. Another interpretation would be that this process represents the chelicera. The punctate oval areas undoubtedly are parts of the pedipalpi, perhaps a stridulatory organ on the coxae.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Trigonomartus woodruffi (Scudder).

Plate IX, fig. 52.

= *Anthracomartus woodruffi* Scudder, Bull. U. S. Geol. Surv., No. 101, 1893, p. 9, pl. I, figs.

The type and only specimen of this species is a mere fragment of the dorsal surface of the abdomen. From its likeness with the preceding species I have placed it in the same genus, since it certainly does not belong to the genus *Anthracomartus*. The surface of the tergites is considerably smoother than in *T. pustulatus* and the abdomen much flatter.

Found in the Pennsylvanic (? Pottsville), of Rhode Island.

Genus *Trigonotarbus* Pocock 1911.

Cephalothorax triangular, elevated in the middle, sloping gradually in all directions, not sculptured. Legs with patella. Anal operculum ventral in position. Genotype *T. johnsoni* Pocock.

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Key to the Species of Trigonotarbus.

1. Coxae of pedipalpi contiguous in median line almost their entire length. Coxae of first pair of legs touching each other
T. schucherti n. sp.

+ Coxae of pedipalpi not contiguous their entire length, coxae of first pair of legs separated by the sternum 2

2. The segment surrounding he anal operculum wider than long. Abdominal sternites moderately recurved
T. carbonarius n. sp.

+ Segment surrounding the anal operculum much longer than wide. Three adjoining abdominal sternites strongly recurved
T. johnsoni.

Trigonotarbus schucherti n. sp.

Plate X, figs. 53, 54; text figs. 63, 64.

The type and only specimen of this species is in the collection of Peabody Museum under No. 169. The reverse shows an almost complete specimen. The obverse shows besides the dorsal surface the superimposed impression of the reverse. This is especially clear if one examines the position of the anal operculum. On the ventral surface it is median in position, whereas on the obverse it is lateral, showing that the two surfaces were laterally dislocated.

Total length 19.0 mm. Cephalothorax triangular, with slightly recurved posterior edge and curved sides, produced anteriorly into a blunt lobe; length in median line 7.5 mm., width at posterior edge 7.0 mm.; high, gradually sloping in all directions. Abdomen oval. Pleural sclerites not subdivided. Visible on the dorsal surface are eight tergites. Anal operculum ventral in position. The plate surrounding it is considerably wider than long, representing probably the fused sternite and tergite of the tenth segment In front of it are seven sternites with moderately recurved edges. In two places the sternites were evidently separated from each other by the pressure of the drying mud in which the specimen was imbedded, exposing the anterior margin of the sternites of the fourth and sixth segments (second and fourth visible sternites). Sternum long and narrow, reaching to base of first coxae, with lateral projections between each consecutive pair of coxae and a narrow process separating the fourth coxae. Coxae of pedipalpi triangular, contiguous their entire length with exception of a small distal space. Chelicera missing. Pedipalpi

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pediform, slender, 9.0 mm. long, with subequal joints. Of the first pair of legs only the trochanter, femur and fraction of the patella preserved. In the second and third pair of legs is missing the metatarsus and tarsus. Left fourth leg complete, 19.2 mm. long. Patella

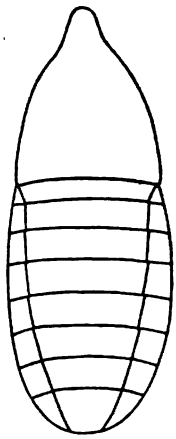

Fig. 63.

Figure 63.—*Trigonotarbus schucherti* n. sp., holotype, Peabody Mus. No. 169, dorsal surface of cephalothorax and abdomen. $\times \frac{8}{1}$

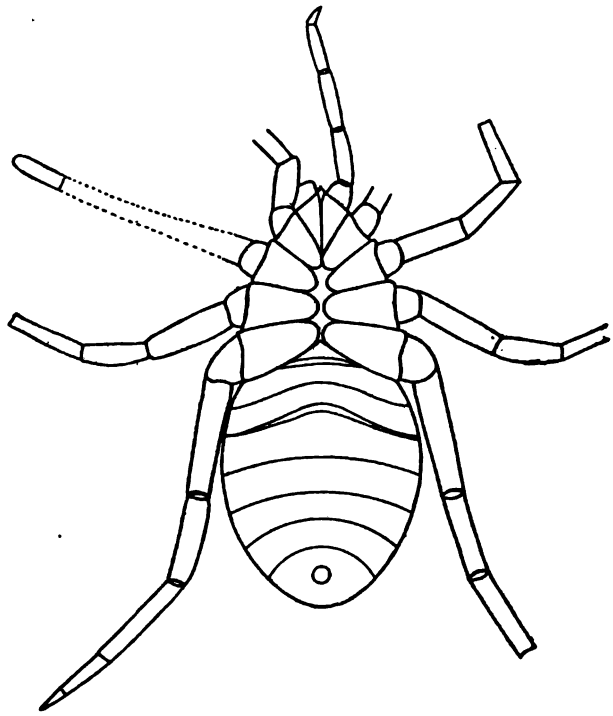

Fig. 64.

Figure 64.—Same, reverse as it appears on nodule. $\times \frac{3}{1}$

present in all legs. Femur I, 2.3 mm.; II, 3.0 mm.; III, 4.0 mm.; IV, 5.1 mm. Tarsus of fourth leg shorter than metatarsus.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Trigonotarbus carbonarius n. sp.

Plate X, fig. 55; text fig. 65.

The type and only specimen of this species is in the U. S. National Museum under No. 37978. The obverse is missing.

Total size 15.5 mm. Abdomen 10.0 mm. long, 8.0 mm. wide in middle. The small coxae of the pedipalpi touch each other only at

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their proximal end. Between them two triangular plates, probably chelicera. Sternum long and narrow, with three pairs of lateral processes, an anterior median, trifid lobe and a posterior bifid lobe. Trochanters one-jointed. Pedipalpi missing. Faint impressions of the third left and second and third right legs. Femur of fourth pair of legs 4.6 mm. long. Anal operculum round. The segment surrounding it much wider than long. Abdominal sternites recurved,

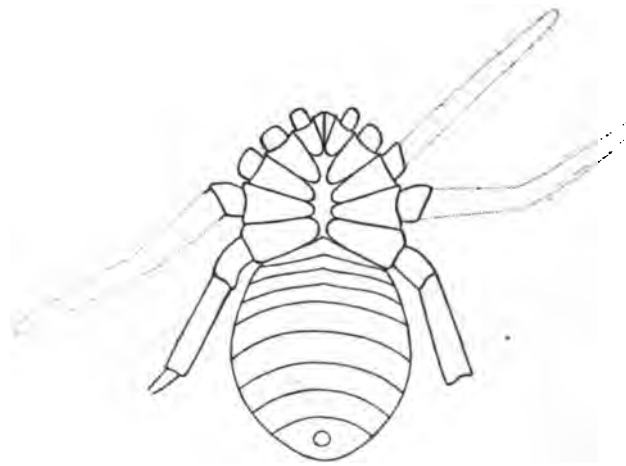

Fig. 65.

Figure 65.—*Trigonotarbus carbonarius* n. sp., holotype, U. S. N. M. No. 37978, ventral surface as it appears on the nodule. × $\frac{3}{1}$

eight in number. Abdomen almost hemispherical in a transverse section, probably spherical in life.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

ORDER OPILIONES

Head completely fused with thorax. Abdomen broadly joined with cephalothorax, composed of ten segments; the anal operculum placed ventrally represents the tergite of the tenth segment. One pair of eyes, sometimes eyes absent. Chelicera three-jointed, chelate. Pedipalpi pediform. Trochanter usually one-jointed. Patella present in all legs. Coxae of first pair of legs and often of the second and third with maxillary lobes. Respiratory organs in the form of tracheal tubes with one pair of spiracles either on the second

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ventral segment, or behind the fourth coxae. In the family Phalangioidae the position of the spiracles is varying, in some species there is a spiracle on each tibia. Genital organs opening with a penis or ovipositor on the first abdominal sternite. Oviparous.

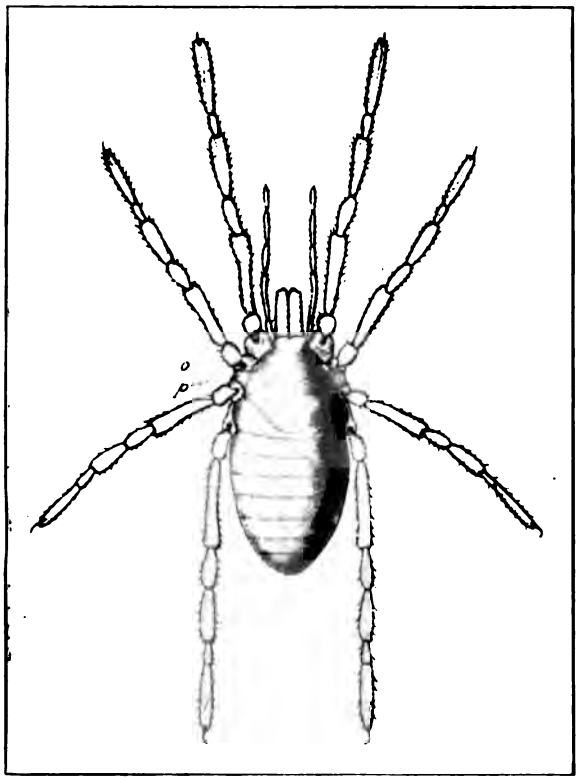

Fig. 66.

Figure 66. — *Stylocellus beccarii* Thorell, from Sumatra ; male viewed from above. (From Hansen and Sörensen, On two Orders of Arachnida, 1904.)

This order shows close relation to Haptopoda and Phalangiotarbi. To facilitate the understanding of the species belonging to the last named order, I reproduce here two figures showing the skeletal structures of an Opilionid belonging to the family Sironoidae of the suborder Cyphophthalmi.

To this order belong probably the following Carboniferous arachnids from Europe :

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Genus *Nemastomoides* Thevenin 1902.

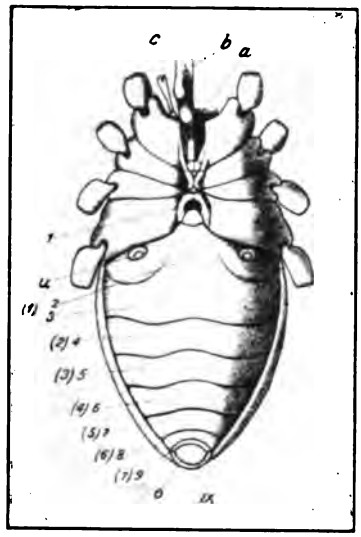

Fig. 67.

Figure 67, — *Stylocellus beccarii* Th., Same, ventral surface. (From Hansen and Sörensen, On two Orders of Arachnida, 1904.)

1. *N. elaveris* Thev., Bull. Soc. Geol. France, (4), Vol. I, 1902, p. 609, pl. XIII, fig. 2. Fritsch, Pal. Arachn., 1904, p. 29, text fig. 34 Pocock, Carb. Arachn., 1911, p. 83, text fig. 42.

   From the Coal Measures of Commentry, France, and Ellismuir, Scotland.

Genus *Dinopilio* Fritsch 1904.

1. *D. gigas* Fritsch, Pal. Arachn., 1904, p. 30, pl. 5, figs. 3—5, text fig. 35.

   From the Coal Measures of Rakonitz, Bohemia.

I refer also to this order the two imperfectly preserved specimens from North America, representing two new species of the new genus *Protopilio*, although they are far from being typical Opilionids.

Protopilio n. gen.

Coxae of all legs without maxillary lobes, those of the fourth pair fully twice as long as first coxae. Sternum oval. Trochanters one-jointed. Legs long and slender. Genotype *P. longipes* n. sp.

Protopilio longipes n. sp.

Plate X, fig. 57; text fig. 68.

The type and only specimen of this species, No. 171 of the Peabody Museum, unfortunately presents onboth hal ves of the nodule the ventral surface alone. It is therefore impossible to say anything about the cephalothorax and the abdominal tergites. If judged by the appearance of the ventral surface, the abdomen is broadly joined to the cephalothorax. The number of visible sternites is nine. The first sternite is small, triangular. The second sternite is by far the largest with a recurved anterior edge. The following two sternites are almost as long as the second. The remaining sternites are very short, with parallel edges with exception of the ninth which is triangular. Ster-

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num oval. In front of it two heavy chelicera, evidently bent downward, so that their distal end reaches the sternum. At the sides of the chelicera are the coxae of the pedipalpi. The coxae of the legs are radiating from the sternum. The fourth coxae are fully twice as long as the first. All trochanters are one-jointed. Of the legs are preserved only the femora of the second right and fourth left leg. They are very long and slender and from their appearance it is prob-

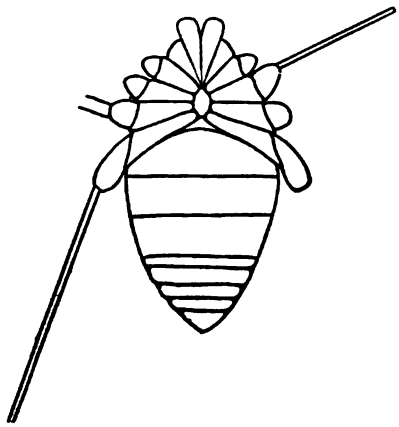

Fig. 68.

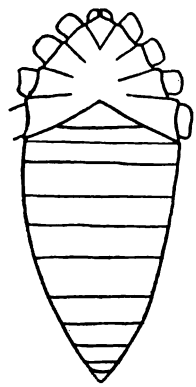

Fig. 69.

Figure 68.—*Protopilio longipes* n. sp., holotype, Peabody Mus. No. 171, ventral surface. Figure 69.—*Protopilio depressus* n. sp., holotype, U. S. N. M. No. 37974, ventral surface. × $\frac{4}{1}$

able that all legs were long and slender. The whole body is quite flat. Total size with chelicera 10.5 mm.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek Illinois.

Protopilio depressus n. sp.

Plate X, fig. 56; text fig. 69.

A very imperfectly preserved specimen in the U. S. National Museum under No. 37974. The nodule presents both the obverse and reverse, but the detail of the structures cannot be seen. Abdomen chipped off at its extreme end. Probable length of the body 24.5 mm. Width of abdomen on the level of the posterior edge of the second sternite 10.0 mm. In the anterior part of the abdomen several heavy transverse folds which make the counting of sternites in this region very uncertain. Beginning with the fourth sternite represented in

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text figure 69, the demarcation lines are quite clear, but beyond the seventh sternite they become faint. Probable number of sternites eleven. Coxae visible only at their distal ends. Sternum obliterated.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

ORDER HAPTOPODA

Head completely fused with thorax. Abdomen broadly joined with cephalothorax, composed of eleven segments. Pedipalpi short, pediform. Terminal segment of the first pair of legs seven-jointed, modified into a tactile organ. Coxae without maxillary lobes.

This order is so closely related to the Phalangiotarbi, that it seems to have been more reasonable to place the only genus and species known in a separate family under the latter order. The segmentation of the first tarsus is about the only character of importance separating the two Orders. Yet we must not forget that in the order of Solifugids for example the tarsus shoes a different number of joints in closely related genera. That the seven-jointed tarsus of *Plesiosiro madeleyi* is a tactile organ is a hypothesis which can be neither substantiated nor disproved. However, since I have not seen any specimen of the only known species, I have retained Pocock's order and refer the reader for details to his Monograph.

Family Plesiosironidae.

Genus *Plesiosiro* Pocock 1911.

1. *P. madeleyi* Pocock, Carb. Arachn., 1911, p. 44, pl. II, fig. 5, text figs. 15, 16.

Found in the Coal Measures of Coseley, near Dudley, England.

ORDER PHALANGIOTARBI

Head completely fused with thorax. Abdomen broadly joined to the cephalothorax. Pleurae soft, without sclerites, not segmented. Several anterior abdominal tergites very short, with a thickened posterior edge. Chelicera not known. Pedipalpi short, pediform. Coxae without maxillary lobes. All trochanters one-jointed. Patella always developed. Anus subapical or ventral in position, closed by an operculum. Abdomen composed of ten to twelve segments. Eyes, when present, in the number of two on the cephalothorax.

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Key to the Families of Phalangiotarbi.

1. Third and 4th pair of coxae elongated, meeting in the median line. First pair of legs slender and long
Heterotarbidae
+ All coxae triangular. All legs short and stout 2
2. Coxae of first pair of legs contiguous throughout their entire length
Architarbidae
+ Coxae of first pair of legs contiguous only at their proximal end. Between them are the coxae of the pedipalpi
Phalangiotarbidae.

LIST OF DESCRIBED SPECIES OF PHALANGIOTARBI

Family Phalangiotarbidae.

Genus *Phalangiotarbus* Haase 1890.

1. *P. subovalis* (H. Woodward)
= *Architarbus subovalis* H. Woodward, Geol. Mag. Vol. IX, 1872, p. 385, pl. IX, fig. 1.
P. subovalis Haase, Zeits. d. g. Gesell., Vol. XLII, 1890, pp. 638, 650, pl. XXX, fig. 3.
= *Architarbus subovalis* Fritsch, Pal. Arachn., 1904, p. 35, text fig. 39.
P. subovalis Pocock, Carb. Arachn., 1911, p. 46, text fig. 17.
From the Coal Measures of Lancashire, England.

Genus *Geratarbus* Scudder 1890.

1. *G. acoei* Scudder, Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 448, pl. 40, fig. 11.
From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.
2. *G. minutus* n. sp.
From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Discotarbus n. gen.

1. *D. deplanatus* n. sp.
From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Metatarbus n. gen.

1. *M. triangularis* n. sp.
From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

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Family Architarbidae.

Genus *Architarbus* Scudder 1868.

1. *A. rotundatus* Scudder, Geol. Surv. Illinois, Vol. III, 1868, p. 568, fig. 4.
   = *Geraphrynus carbonarius* Scudder, Proc. Amer. Acad. Arts Sci., Vol. XX, 1884, p. 16. Id., Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 446, pl. 40, figs. 1, 9, 10, 12.
   From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.
2. *A. horribilis* (Melander)
   = *Hadrachne horribilis* Melander, Journ. Geol., Vol. XI, 1903, p. 180, pl. V, fig. 1; pl. VII, fig. 1.
   From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.
3. *A. angulatus* (Pocock)
   = *Geraphrynus angulatus* Pocock, Carb. Arachn., 1911, p. 49, pl. III, fig. 2, text figs. 19, 20.
   From the Coal Measures of Coseley, near Dudley, England.
4. *A. hindi* (Pocock)
   = *Geraphrynus hindi* Pocock, loc. cit., p. 51, text figs. 20, 21.
   From the Coal Measures of Coseley, near Dudley, England.
5. *A. eggintoni* (Pocock)
   = *Geraphrynus eggintoni* Pocock, loc. cit., p. 53, text figs. 24, 25.
   From the Coal Measures of Coseley, near Dudley, England.
6. *A. torpedo* (Pocock)
   = *Geraphrynus torpedo* Pocock, loc. cit., p. 54, text figs. 26, 27; pl. III, fig. 1.
   From the Coal Measures of Coseley, near Dudley, England.
7. *A. angustus* (Pocock)
   = *Geraphrynus angustus* Pocock, loc. cit. p. 55.
   From the Coal Measures of Coseley, near Dudley, England.
8. *A. minor* n. sp.
   From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Genus *Opiliotarbus* Pocock 1910.

1. *O. elongatus* (Scudder)
   = *Architarbus elongatus* Scudder, Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 449, pl. 40, fig. 4.
   = *Geraphrynus elongatus* Fritsch, Pal. Arachn., 1904, p. 33, text fig. 37.
   O. elongatus Pocock, Geol. Mag., (V), Vol. VII, 1910, p. 511.

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From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Family Heterotarbidae.

Heterotarbus n. gen.

1. *H. ovatus* n. sp.
From the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

DESCRIPTION OF NORTH AMERICAN SPECIES OF PHALANGIOTARBI.

Heterotarbidae n. family.

Coxae of first pair of legs separated by the coxae of the pedipalpi. Coxae of the third and fourth pair of legs elongated meeting in the median line. First pair of legs long and slender, the other legs short and stout. Chelicera small, chelate. Pedipalpi not known, their trochanter large. Cephalothorax triangular. Abdominal tergites ten, the first five much shorter and typical of the order.

Heterotarbus n. gen.

With the characters of the family. Genotype *H. ovatus* n. sp.

Heterotarbus ovatus n. sp.

Plate X, fig. 59; text fig. 70.

The type and only specimen of this interesting species is in the collection of Mr. L. E. Daniels. The dorsal and ventral surface are superimposed both on the obverse and reverse of the nodule. The demarcation lines between the sternites being considerably fainter than those between the tergites, especially in the anterior region of the abdomen where the narrow tergites have a thickened poster or edge, the sternites cannot be counted safely. The first sternite is the only one clearly visible and is large and distinctly triangular. For the same reason the posterior edge of the cephalothorax is not clearly defined.

Total length probably 14.0 mm., but the end of the abdomen is broken off, so that the actual length cannot be given. Cephalothorax triangular, 7.3 mm. wide in the region of the first tergite; its probable length 4.8 mm. The anterior five abdominal tergites very short, the first and second slightly procurved, the third with a straight posterior edge, the fourth and fifth slightly recurved. Each of these tergites has a median ridge. The following tergites are much longer,

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straight. The tenth tergite was probably the last. On the edges of the abdomen are visible the pleurae. They are not segmented, and were probably soft. Chelicera very small, turned downward, with a line dividing them half-way into two parts probably representing the fingers of a chela. At the sides of the chelicera are visible the trochanters of the pedipalpi separating the legs of the first pair. The outlines of the coxae of the first pair cannot be traced all the way backward. The coxae of the second pair are triangular and widely separate. The coxae of the third and fourth pair are very long, contiguous, meeting in a median line. All trochanters one-jointed. Trochanter of the first part of legs conical, the others rectangular. The first leg is slender and long, its femur measures 3.85 mm., patella 2.66 mm. tibia 7.8 mm., metatarsus 2.7 mm., tarsus missing. Second leg is the shortest; it is heavy, its femur and patella of the same length, tibia somewhat shorter, metatarsus shorter than the width of the patella, tarsus conical. The third leg is heavier and longer than the second, but its three distal joints are missing. The fourth leg is still heavier and longer, but only trochanter and part of femur preserved. The whole body is smooth.

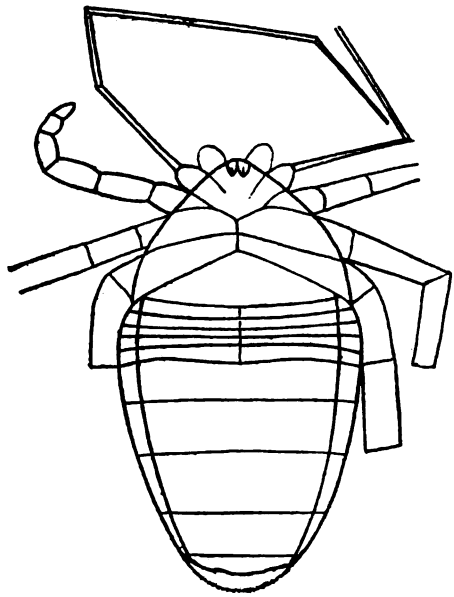

Fig. 70.

Figure 70.—*Heterotarbus ovatus* n. sp., holotype, Daniels coll., dorsal surface, with the coxae and chelicera superimposed on the cephalothorax. $\times \frac{4}{1}$

The species is of great interest since it combines characters of two orders: Opiliones and Phalangiotarbi. The arrangement of the coxae and the chelate chelicera remind of the former, while the segmentation of the abdomen is typical of the latter.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

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Family Phalangiotarbidae.

New definition. Coxae of pedipalpi wedged in between the coxae of the first pair of legs, narrow and long, contiguous throughout their entire length. Sternum oval or elongated, with the coxae of the legs radiating from it and increasing in length from the first to the fourth. Trochanters of the first and second leg always one-jointed. Patella developed. Legs all short and stout. Abdominal tergites, not counting the ventrally placed operculum anale, ten. The first five or four tergites very short with heavily thickened posterior edge appearing in the specimens as a deep groove. Genital opening on the first sternite. Pleurae soft, not segmented.

Key to the Genera of Phalangiotarbidae.

1. Posterior edge of the cephalothorax straight or very slightly procurved. The first 5 abdominal tergites straight or almost straight 2
   + posterior edge of the cephalothorax strongly procurved. The first 2 or 3 tergites strongly procurved 3
2. Coxae of the 1st pair of legs completely separated by the coxae of the pedipalpi. Coxae of the 4th pair far apart
   Phalangiotarbus
   + Coxae of the 1st pair of legs contiguous at their base. Coxae of the 4th pair approximated
   Geratarbus
3. Abdomen disc-shaped, quite flat. Posterior corners of the cephalothorax angular
   Discotarbus
   + Abdomen oval. Posterior corners of the cephalothorax rounded
   Metatarbus.

Genus *Geratarbus* Scudder.

New definition. Coxae of pedipalpi wedge-shaped, coxae of first pair of legs contiguous at base. Posterior edge of cephalothorax almost or quite straight. Anterior five abdominal tergites straight, the following very slightly recurved. Sternum oval. Abdominal sternites divided into three fields by longitudinal lines. Genotype *G. lacoei* Scudder.

Key to the Species of Geratarbus.

1. Cephalothorax with parallel sides and broad anterior edge
   G. lacoei
   + Cephalothorax with rounded sides converging anteriorly to a sharp point
   G. minutus.

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Geratarbus lacoei Scudder.

Plate XI, fig. 68; text figs. 71, 72.

G. lacoei Scudder, Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 448, pl. 40, fig. 11.

The type and only specimen of this species, No. 1765 of the Lacoe collection, is in the U. S. National Museum under No. 37966. The obverse shows the dorsal surface with the impressions of the coxae superimposed over the cephalothorax, the reverse shows the ventral surface clear; but abdominal sternites are totally obliterated on both

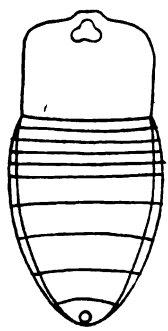

Fig. 71.

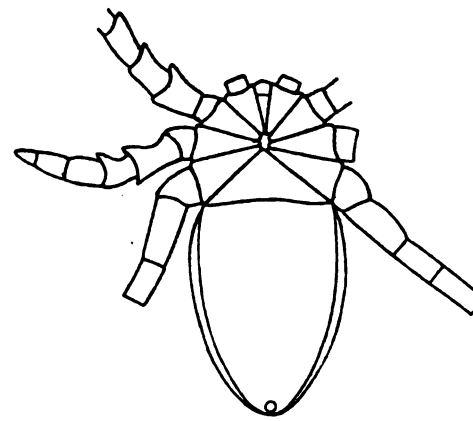

Fig. 72.

Figure 71.—*Geratarbus lacoei* Scud., holotype, U. S. N. M. No. 37966, dorsal surface. Figure 72.—Same, ventral surface. × $\frac{4}{1}$

the obverse and reverse. The description given by Scudder is incorrect in many points, he having omitted to clean the kaolin off the specimen.

Total length 10.5 mm. Cephalothorax 3.6 mm. long, 4.2 mm. wide. Its posterior edge very slightly procurved, almost straight. The sides are parallel, the anterior corners rounded. The anterior edge presents a broad projection in the middle with sloping sides and truncated front. Immediately behind this projection is a more or less triangular depression with rounded angles and emarginate sides, representing probably the eye tubercle. Abdomen oval. The anal operculum appears on both the ventral and dorsal surfaces, but must have been ventral in position. Of the ten tergites, the anterior five are short, with heavily thickened posterior edge, typical of the order. The pleura is not segmented and was evidently soft. Chelicera

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missing; of the pedipalpi preserved only the coxae which are wedge-shaped and apparently completely fused together, forming one triangular plate. Sternum small, oval. Radiating from it are the triangular coxae of the legs. The first coxae are contiguous at their base (apex of the triangle); the fourth coxae are $1\frac{1}{2}$ times as long as the first. The first sternite, the only one visible, is large, triangular. Trochanters one-jointed. The third left leg is complete, its femur and patella with an anterior apical process. The second leg shows similar processes in the same joints and in the tibia; its metatarsus and tarsus are missing. The joints of the fourth leg are without the apical process, metatarsus and tarsus also missing. The body is smooth, the legs are coarsely and distinctly punctate.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Geratarbus minutus n. sp.

Plate XI, fig. 69; text figs. 73, 74.

There are altogether six specimens of this species in the Peabody Museum. Their numbers are 176 (type), and 177–181.

All are approximately of the same size, their length varying from 9.1 to 10.6 mm. Some are of course better preserved than others, yet all show the same structure. No. 176 being the best preserved specimen, I chose it for holotype.

Body flat. Total length 9.1 mm. Cephalothorax 3.1 mm. long, 3.5 mm. wide at posterior edge which is perfectly straight. The sides of the cephalothorax are rounded, converging in front to a sharp point. Its surface perfectly smooth; eyes absent. The anal operculum round, impressed on both the dorsal and ventral surfaces. Abdominal tergites ten. The anterior five short, with heavily thickened posterior edge and a median ridge, straight. The following tergites longer, slightly recurved. Pleura not segmented, forming a heavy ridge alongside the abdomen on its ventral surface, anteriorly chipped off exposing the ends of the sternites. Five abdominal sternites in front of the last sternite divided by two longitudinal lines into three fields. The triangular area between the hind coxae with an almost round genital operculum divided by a transverse line. Chelicera missing. Coxae of pedipalpi wedge-shaped, contiguous throughout their length. Sternum large, longer than wide, with three pairs of lateral projections and a median posterior lobe separating the hind coxae. All coxae with rounded base. Coxae of first pair twice as short as those of the fourth pair, contiguous at base. Trochanters one-jointed. Legs short, but not as heavy as in *G. lacoei*, femora and

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patellae without apical process. Text figure 74 shows all legs as they appear on the reverse. The majority of specimens have only fragments of legs. Dorsal surface of abdomen appearing also on the reverse. Abdomen smooth. Legs and distal ends of coxae distinctly punctate.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

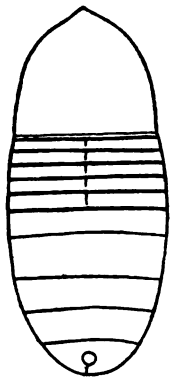

Fig. 73.

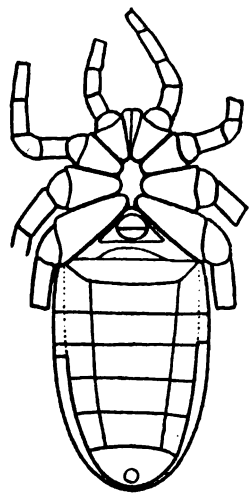

Fig. 74.

Figure 73.—*Geratarbus minutus* n. sp., holotype, Peabody Mus. No. 176, dorsal view of cephalothorax and abdomen. Figure 74.—Same, ventral surface with legs. $\times \frac{5}{1}$

Discotarbus n. gen.

Cephalothorax triangular with strongly procurved posterior edge and curved sides. Posterior corners angular. Abdomen round and very wide; of the five short tergites with heavily thickened posterior edge, the first three are procurved, the fourth and fifth straight. The sixth tergite is short, but without thickened edge. Sternum long, divided into three areas of which the middle one is hexagonal and the other two pentagonal. Body very flat. Genotype *D. deplanatus* n. sp.

Discotarbus deplanatus n. sp.

Plate XII, fig. 10; text figs. 75, 76.

Two specimens, Nos. 174 and 175, in the Peabody Museum. The first is twice as small as the second, but better preserved. Since the larger specimen shows the same structure there is no reason for separating it into another species. I choose the smaller specimen, No. 174, as holotype.

Type specimen. Total length 11.25 mm. Cephalothorax 4.5 mm. long, 5.12 mm. wide between the posterior corners. Posterior edge strongly procurved. Sides curved. Eyes absent. Five anterior tergites very short, with heavily thickened posterior edge. First, second and third tergites procurved; fourth, fifth and sixth straight;

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the others recurved. The sixth tergite somewhat longer than the preceding, but its posterior edge not thickened. Anal operculum round, impressed clearly on the dorsal surface; the reverse does not show it because the end of the abdomen is chipped off. Sternites not visible, the tergites appearing as clearly on the ventral surface as on the dorsal, only reversed, *i. e.* what appears as a groove on the dorsal surface has a counterpart in a ridge on the ventral surface. Only the first sternite is clearly visible, small, triangular.

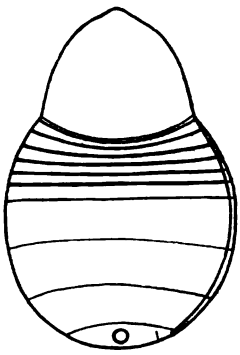

Fig. 75.

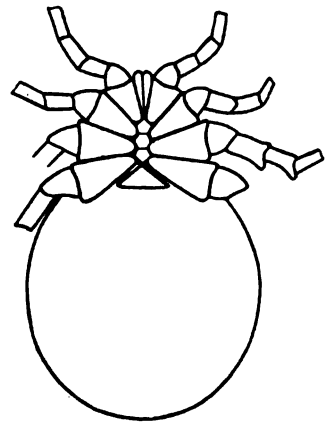

Fig. 76.

Figure 75.—*Discotarbus deplanatus* n. sp., holotype, Peabody Mus. No. 174, showing the cephalothorax and abdomen. Figure 76.—Same, ventral surface. $\times \frac{4}{1}$

Sternum long, divided into three areas of which the middle one is hexagonal, the other two pentagonal. Coxae of pedipalpi wedge-shaped, contiguous throughout their entire length. Coxae of first pair contiguous at base. Coxae of fourth pair of legs $1^2/_3$ as long as those of the first pair. Trochanters one-jointed. Legs short. Patella of first leg longer than femur. Patella and femur of third leg with a distal posterior process. Whole body quite flat and smooth, apparently covered with a thin layer of graphite.

Total size of specimen No. 175, 23.5 mm. Cephalothorax 9.0 mm. long, 11.0 mm. wide between the posterior corners.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Metatarbus n. gen.

Cephalothorax triangular, with posterior corners rounded. Posterior edge procurved. Eyes absent. Only four anterior abdominal

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segments with a heavily thickened posterior edge. The first, second, and third tergites procurved, the fourth with a procurved anterior and recurved posterior edge. The following tergites slightly recurved. Sternum elongated, divided into three areas of which the middle one is hexagonal and the two others pentagonal. Abdomen oval, with ten tergites and seven sternites. Genotype *M. triangularis* n. sp.

Metatarbus triangularis n. sp.

Plate XI, figs. 66, 67; text figs. 77, 78.

The type specimen of this species is in the Peabody Museum, No. 182. It is somewhat deformed, so that the left half is narrower

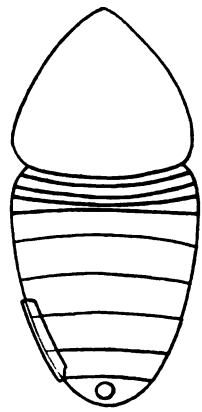

Fig. 77.

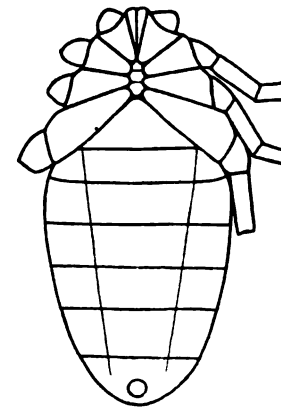

Fig. 78.

Figure 77.—*Metatarbus triangularis* n. sp., holotype, Peabody Mus. No. 182, dorsal surface. Figure 78.—Some, ventral surface. $\times \frac{3}{1}$

than the right half, but otherwise well preserved. Total length 17.5 mm. Cephalothorax triangular, posterior edge procurved, posterior corners rounded, sides curved. Length in median line 7.5 mm. Maximum width 8.0 mm. Eyes absent. Abdominal tergites ten. Only four anterior tergites short and with heavily thickened posterior edge. First, second and third tergites procurved, fourth with a procurved anterior and recurved posterior edge. The following tergites slightly recurved. Sternites seven. The first sternite triangular. Two converging lines divide the ventral surface of the abdomen into three fields. Anus round, ventral in position, its operculum impressed on both the dorsal and ventral surfaces. Sternum long, divided into three areas of which the middle one is hexagonal,

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the other two pentagonal. Coxae of pedipalpi wedge-shaped, contiguous throughout their entire length. Coxae of first pair contiguous at base. Coxae of fourth pair more than twice as long as those of first pair. Trochanters one-jointed. Of the legs preserved only the femora of the second, third and fourth leg. Pleura not segmented, probably soft, appearing as heavy ridge at one side of the abdomen. Body quite smooth.

Specimen in the Museum of Comparative Zoology, Harvard University, not numbered, but accompanied by a label which reads: Libellula carbonaria Scudder, AAAS, Vol. XXIV, B, 1875. In every respect similar to the type specimen, but not as well preserved. Of the cephalothorax preserved the proximal end only. Length of abdomen 9.2 mm.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Family Architarbidae.

(New definition.) Cephalothorax broadly joined to the abdomen. Pedipalpi short, pediform. Coxae of first pair of legs contiguous throughout their entire length. Eyes, when present, in the number of two, on the cephalothorax. Anal operculum ventral in position. Abdominal tergites nine to eleven, the anterior five or six much shorter than the following, with a heavily thickened posterior edge, typical of the order. Abdominal sternites seven or eight. Pleura not segmented, soft.

Key to the Genera of Architarbidae.

1. Cephalothorax produced posteriorly, with curved sides converging to a point. Five or 6 anterior tergites distinctly procurved. Sternum well developed

Architarbus

\+ Cephalothorax with a straight posterior edge, broadly rounded in front. Anterior abdominal tergites straight. Sternum reduced to a line

Opiliotarbus.

Genus *Architarbus*[1] Scudder 1868.

New definition. Cephalothorax produced posteriorly or at least with a very strongly procurved posterior edge. Anteriorly it is

[1] *Geraphrynus* is a synonym of *Architarbus*. See Introduction and the description of *Architarbus rotundatus*.

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drawn out to a sharp point, almost having the appearance of a spine. Anterior five or six tergites procurved, with heavily thickened posterior edge. Pedipalpi short, pediform. Sternum long, divided into three areas of which the middle one is hexagonal, the other two pentagonal. Ventral surface of abdomen divided into three fields by two longitudinal lines. Genotype *A. rotundatus* Scudder.

Key to North American Species of Architarbus.

1. Cephalothorax slightly produced posteriorly. Size very large
A. horribilis

\+ cephalothorax produced posteriorly into a long lobe. Size much smaller 2

2. Anterior 6 tergites very short in the middle. Abdomen broadly rounded
A. minor n. sp.

\+ 4th, 5th and 6th tergites not conspicuously short in middle, with almost parallel edges. Abdomen oval, widest in front
A. rotundatus.

The specimens of *Architarbus*, like all other Phalangiotarbi, have certain peculiarities of structure which one must bear in mind to avoid false interpretation. Both surfaces are usually superimposed, the ventral over the dorsal on the obverse and the dorsal over the ventral on the reverse. What is a ridge on the obverse appears as a groove on the reverse. This and the fact that the demarcation lines between the tergites and sternites do not coincide, help to recognize the structures belonging to the dorsal surface from those belonging to the ventral. Even Pocock seems not to have escaped an error in drawing the tergites divided by two longitudinal lines into three fields in some of his species. These lines belong undoubtedly to the ventral surface. Thus in some specimens of *A. rotundatus*, where a superimposition of the surfaces for some reason did not take place, the lines appear only on the ventral surface. The anal operculum is always better visible on the dorsal surface than on the ventral where it belongs. The reason for this may be sought in an internal ring-shaped thickening of the opercular edge, or still more probably in an internal thickening of the wall of the anus itself. The anus itself being placed ventrally, the internal ring-shaped thickening would naturally be better visible on the dorsal surface after the two surfaces came in contact with each other under the pressure of the drying mud in which the specimen was imbedded.

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Architarbus rotundatus Scudder.

Plate VII, figs. 74—79, 81—83; text figs. 79, 80.

A. rotundatus Scudder, Geol. Surv. Illinois, Vol. III, 1868, p. 568.

= *Geraphrynus carbonarius* Idem, Mem. Boston Soc. Nat. Hist., 1890, p. 446, pl. 40, figs. 1, 9, 10, 12.

A. rotundatus Melander, Jour. Geol., Vol. XI, 1903, p. 181, pl. V, fig. 2; pl. VII, fig. 2.

= *Geraphrynus carbonarius* Idem, Ibid., p. 181, pl. V, fig. 3; pl. VII, fig. 3.

There are altogether seventeen more or less well preserved specimens of this species distributed as follows:

One specimen, No. 1116, the type specimen of *A. rotundatus*, in the collection of the University of Illinois.

Nine specimens, Nos. 1116, 37961, 37962, 37979, 37980, of which several are under the same numbers, in the collection of the U. S. National Museum. Of these No. 37961 was originally No. 1701 ab of the Lacoe collection and is the type of *Geraphrynus carbonarius*.

Two specimens in the Daniels collection.

Two specimens in the Walker Museum of the University of Chicago. Of these Nr. 9234 was identified by Melander as *A. rotundatus*, and No. 9233 as *Geraphrynus carbonarius*.

Three specimens, Nos. 185, 186, 187 in the collection of the Peabody Museum of Yale University.

All specimens come from the same locality and have the same structure, although their size varies from 12 to 24 mm. Hansen and Sörensen are decidedly wrong when they suggest that the three specimens of *Geraphrynus carbonarius* represented by Scudder in plate 40, figs. 1, 10, and 12 " belong to at least two different genera, perhaps even to different families or orders " (p. 139). Scudder has correctly recognized the specimens as belonging to the same species and if he had cleaned the type specimen of *A. rotundatus* of the heavy layer of kaolin with which it was covered he would have undoubtedly recognized the identity of his two types.

A photograph of the type specimen of *Architarbus rotundatus* after I have carefully cleaned it, is given on plate XII, fig. 74. Photographs of the obverse and reverse of the type specimen of *Geraphrynus carbonarius* are given on plate XIII, fig. 80. · There is no difference whatever in the proportions or the details of structure. The first is 20.0 mm. long, the second 19.0 mm. Specimen No. 37979 of the U. S. National Museum is reproduced on plate XII, fig. 72. It is 12.0 mm. long. The better specimen in the Daniels collection is

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reproduced on plate XII, fig. 73. Both specimens of the University of Chicago are in an excellent state of preservation. Specimen No. 9233 is reproduced on plate XIII, fig. 76 and 77. It shows only few traces of the anterior tergites superimposed over the sternites, especially visible on the right edge of the abdomen. Specimen No. 9234 is reproduced on plate XII, fig. 75. The apparently larger width of its abdomen is due to greater flattening under pressure of the drying mud, and consequently both surfaces are clearly superimposed. This specimen measures 24.0 mm. The best preserved specimen is the one in the Peabody Museum, No. 185, reproduced on plate XIII, figs. 78, 79. Unfortunately the photographs did not come out as well as they should. This specimen was very little compressed dorsoventrally; consequently the obverse shows only the dorsal surface, while on the revers eare visible the impressions of the abdominal anterior tergites on the sides only of the abdomen. Omitting further discussion of other specimens I shall now give a detailed description of the last mentioned.

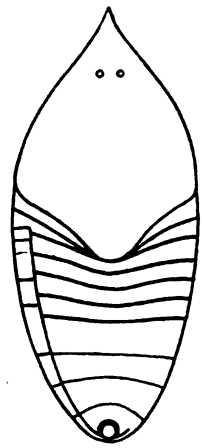

Fig. 79.

Fig. 79.—*Architarbus rotundatus* Scudder, specimen No. 185 of the Peabody Museum; dorsal surface of cephalothorax and abdomen. $\times \frac{2.5}{1}$

Specimen No. 185 of the Peabody Museum. Total length 21.75 mm. Cephalothorax 12.7 mm. long in middle line, 9.1 mm. wide. It has rounded latero-posterior corners and is posteriorly produced into a median lobe with rounded end and concave sides. Anteriorly the cephalothorax forms a sharp spine-like projection. The cephalothorax is high, sloping gradually to the sides and front. Two small, round eyes, 3.25 mm. from anterior end, about double their diameter apart. The posterior lobe of the cephalothorax reaches as far as the anterior edge of the third tergite. It is impossible to decide whether the first and second tergites are each composed of two sclerites, or whether the lobe of the cephalothorax merely covers the short median part of these tergites. The following four tergites are short, but with more or less parallel procurved edges. The posterior edge of all six tergites is heavily thickened and appears in the specimen as a deep groove. The demarcation lines between the following four tergites are also clearly visible, but appear in the specimen as narrow, low ridges, which proves that the edge of these

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segments was not thickened. The pleura appears as a heavy ridge along the sides of the abdomen. In life it must have been soft and not segmented, the cross lines being due to folding. In places the pleura is chipped off and under it is exposed the edge of the abdomen. The anus is visible on both the reverse and obverse. In

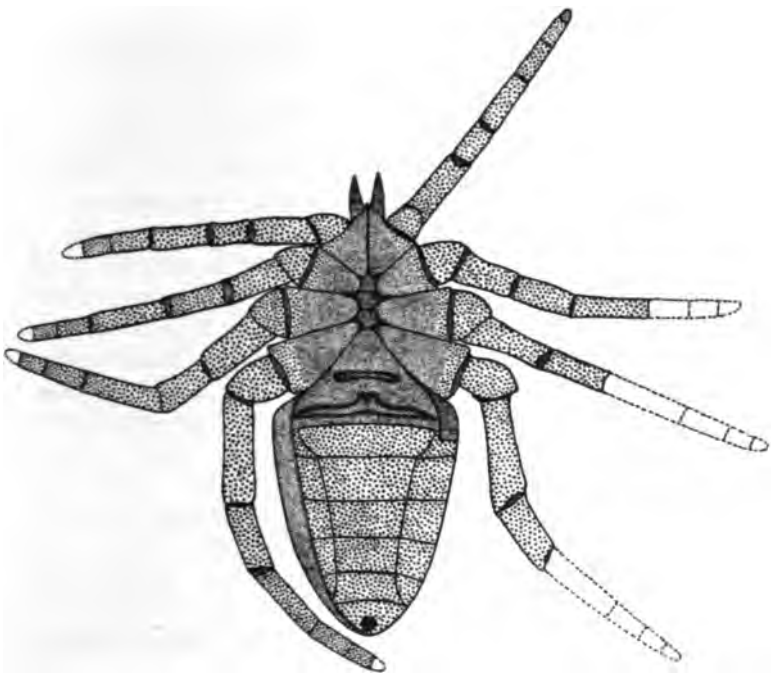

Fig. 80.

Figure 80.—*Architarbus rotundatus* Scudder, specimen No. 185 ventral surface as it appears on the nodule with this difference, that the left fourth leg in the specimen is curved inwardly and lies under the abdomen. $\times \frac{2.5}{1}$

the latter it appears in the tenth tergite close to the pleura, and is surrounded by a heavy wall. The surface leaves no doubt that the anus was protected by a round operculum, placed ventrally. The cephalothorax is smooth, but the abdominal tergites are clearly punctate.

The number of sternites is apparently only seven The first sternite is very large, triangular, smooth. It has a deep transverse groove representing probably the mould of a ridge or movable plate

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protecting the genital opening. Behind this groove is another transverse depression of singular form, extending across the whole sternite and represented in the text figure. The meaning of this structure is not at all clear. It may be part of the external genital apparatus, or the cover of the organs of respiration, or it may have had both functions. The following five sternites are divided into three fields by two longitudinal lines, appearing in the specimen as very low ridges. These sternites and the last or seventh are clearly punctate.

The chelicera are missing. The pedipalpi are very short, pediform, only three last joints visible. The sternum is long and typically composed of three areas of which the middle one is hexagonal and the other two pentagonal. The coxae are triangular, with rounded base (apex of the triangle). The coxae of the first pair of legs are contiguous throughout their entire length, produced anteriorly into a sharp process. Whether this process represents a maxillary lobe is very difficult to decide, since there is no evidence to either prove or disprove the assumption that these coxae are immovable. The coxae of the fourth pair are not quite twice as long as those of the first. All coxae are smooth with exception of their distal end which is punctate. Legs all preserved. Those of the left side complete but for the tarsus. The fourth left leg is, however, in reality bent under the abdomen where it lies on one surface with a fern. The first right leg is quite complete, wihle the other legs of the right side are broken off at the patella-tibia articulation line. The trochanters are one-jointed. Patella shorter than femur. The tarsus of the first leg is two-jointed, and so was probably the tarsus of all legs. The legs are in order 4321. First leg 14.0 mm., second (without last tarsal joint) 15.75 mm., third (same way) 17.0 mm., fourth (same way) 19.25 mm. Length of fourth femur 5.5 mm.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Architarbus minor n. sp.

Plate XIII, figs. 81, 82; text figs. 81, 82.

The type and only specimen of this species is in the Peabody Museum, No. 189. The dorsal and ventral surface are superimposed on both the obverse and reverse of the nodule, but the structures are quite clear. Total length 15.0 mm. Cephalothorax 10.0 mm. long in the median line, 6.6 mm. wide. Posteriorly it is produced into a lobe rounded at its end and with concave sides. Anteriorly

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the cephalothorax forms a long, pointed process. The eyes are very small, almost four times their diameter apart. The six anterior tergites have a rather peculiar shape, being strongly procurved, very short in the middle and much longer at the sides. Their posterior edge is heavily thickened. The lobe of the cephalothorax extends as far as the anterior edge of the second tergite. The demarcation lines between the last four tergites are light, but

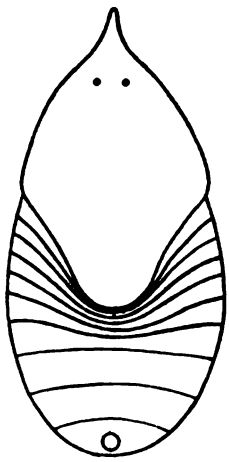

Fig. 81.

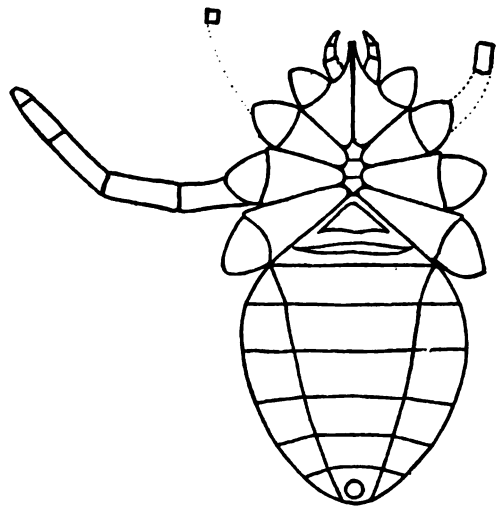

Fig. 82.

Figure 81.—*Architarbus minor* n. sp., holotype, Peabody Mus. No. 189, dorsal view of cephalothorax and abdomen. Figure 82.—Same, ventral surface. $\times \frac{4}{1}$

clear. Anal opercle appears on both surfaces. The abdominal sternites very much like those in the preceding species, but the converging lines divide the last sternite also. Instead of a transverse groove, a triangular depression in the first sternite. Sternum typical. The coxae of the first pair of legs with a very pronounced apical process. Pedipalpi small, pediform, only three terminal joints visible. Trochanters one-jointed. Of the legs the left third is alone preserved. The patella of this leg is longer than the femur. The tarsus is apparently one-jointed.

Abdomen and legs punctate above and below. The greater part of the cephalothorax smooth, but a punctate area occupies the space between the eyes, extending backward to the middle of the cephalothorax and reaching anteriorly its end.

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Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Architarbus horribilis (Melander).

Plate XII, fig. 71; text figs. 83, 84.

= *Hadrachne horribilis* Melander, Jour. Geol., Vol. XI, 1903, p. 180, pl. V, fig. 1; pl. VII, fig. 1.

The type and only specimen of this species, No. 9232 of the Walker Museum of the University of Chicago, presents only the

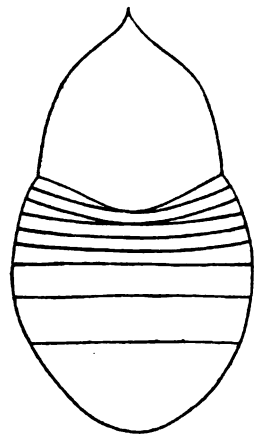

Fig. 83.

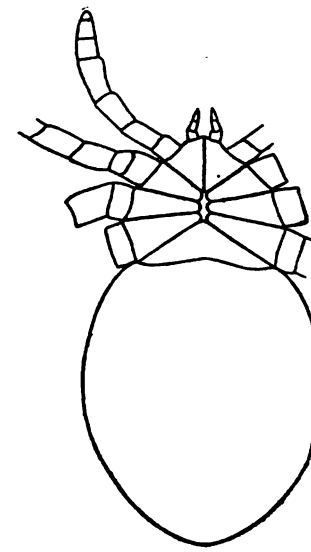

Fig. 84.

Figure 83.—*Architarbus horribilis* (Melander), holotype, Univ. of Chicago Mus. No. 9232, dorsal surface showing cephalothorax and abdomen. Figure 84.—Same, showing the ventral surface. Both surfaces appear in the specimen superimposed, and since the reverse is missing the sternites are not visible. $\times \frac{1.5}{1}$

obverse with the ventral surface superimposed on the dorsal. Partly owing to this, partly to the fact that the specimen was not sufficiently cleaned, the description of Melander is incorrect in several respects. Moreover, he committed the same error as Scudder in two instances, by assuming the legs of the first pair to be the pedipalpi.

Total length 38.0 mm. Cephalothorax 18.3 mm. long in middle line, 16.3 mm. wide at posterior corners which are not rounded,

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but form an angle with the strongly procurved posterior edge. The sides of the cephalothorax converge anteriorly to a sharp point, forming an almost spine-like projection. The whole surface of the cephalothorax is smooth. Eyes apparently absent. Six anterior tergites with heavily thickened posterior edge. Behind the sixth tergite are visible only two lines, but it seems probable that the abdomen had ten tergites and that the line separating the ninth from the tenth tergite became obliterated. Anal operculum not visible. Sternum badly deformed but apparently typical. Pedipalpi small, pediform, only the terminal three joints visible. Coxae of the first pair of legs contiguous throughout their entire length, with an internal distal lobe. Trochanters one-jointed. The trochanter of the second leg appears to be two-jointed, but the distal joint represents apparently the soft membrane connecting the trochanter with the femur and distended because the leg lies on its dorsal surface. Tarsus of first leg two-jointed. Patella longer than femur.

Found in the Pennsylvanic (Lower Allegheny) of Mazon Creek, Illinois.

Genus *Opiliotarbus* Pocock 1900.

New definition. Cephalothorax with a straight posterior edge, perfectly rounded anteriorly. Anterior six tergites very short, straight, with a heavily thickened posterior edge. Number of tergites eleven. Sternum very narrow, almost reduced to a narrow ridge. Number of sternites seven. Anal operculum ventral. Coxae of the first pair of legs contiguous throughout their entire length, without internal apical process. Trochanter of the first and second pair of legs one-jointed, of the third and fourth pair two-jointed. Eyes absent. Genotype *O. elongatus* (Scudder).

Opiliotarbus elongatus (Scudder).

Plate XI, figs. 62–65; text figs. 85–88.

= *Architarbus elongatus* Scudder, Mem. Boston Soc. Nat. Hist., Vol. IV, 1890, p. 449, pl. 40, fig. 4.

O. elongatus Pocock, Geol. Mag., (V), Vol. VII, 1910, p. 511.

Two specimens in the collection of the U. S. National Museum. Specimen No. 37975 from Mazon Creek is not as well preserved as the type specimen; but the end of the abdomen is not broken off and the details of the structure are sufficiently clear. The proportions of the body are somewhat different from the type, but not sufficient, in my mind, to constitute a different species. The text figures being carefully drawn to scale reveal no tangible

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difference. Total size 12.17 mm. Cephalothorax 4.0 mm. long, 5.6 mm. wide at posterior edge. Trochanter of the third and fourth

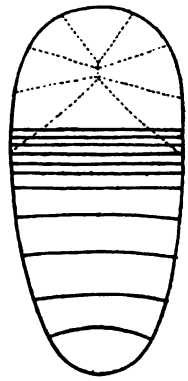

Fig. 85.

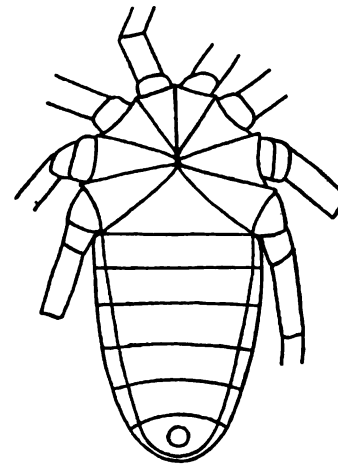

Fig. 86.

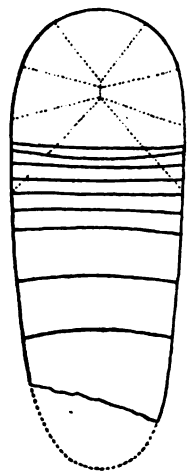

Fig. 87.

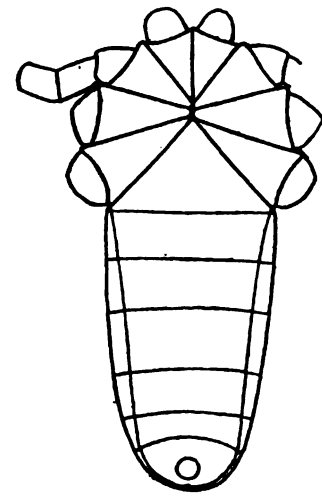

Fig. 88.

Figure 85.—*Opiliotarbus elongatus* (Scudder), U. S. N. M. No. 37975, dorsal surface. Figure 86.—Same, ventral surface. Figure 87.—*Opiliotarbus elongatus*, from the Pennsylvanic (Lower Allegheny), Braidwood, Illinois, holotype, U. S N. M. No. 37970, dorsal surface. Figure 88.—Same, ventral surface. $\times \frac{4}{1}$

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leg two-jointed. Specimen No. 37970 was originally No. 1702 of the Lacoe collection. It is Scudder's type and is indeed excellently preserved but for the end of the abdomen which is missing in the observe. Total size 15.3 mm. Cephalothorax 4.5 mm. long, 5.6 mm. wide at posterior edge which is so little procurved that it appaars almost to be straight. Anteriorly the cephalothorax is broadly rounded. Eyes absent. Six anterior tergites practically straight, with heavily thickened posterior edge, very short. The following tergites much longer, slightly recurved. Since the other specimen has eleven tergites is it fair to assume that the type had also eleven tergites. The number of sternites seven, the first sternite triangular, large. Chelicera and pedipalpi missing. Coxae of the first pair of legs contiguous throughout their length, without internal apical process. Sternum reduced to a narrow ridge. Pleura probably soft, not segmented. Anal operculum round, ventral in position. Body quite smooth. The "moderately coarse punctuation" mentioned by Scudder was due to extraneous matter which was cleaned without difficulty.

Found in the Pennsylvanic (Lover Allegheny) of Braidwood, Illinois.

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EXPLANATION OF PLATES

Correct size of specimens given in the text.

Plate I.

Fig. 1. *Eoscorpius typicus* n. sp., Peabody Mus. No. 126.
2. *Eoscorpiust ypicus* n. sp., holotype, U. S. N. M. No. 37986, obverse.
3. *Eoscorpius typicus* n. sp., same, reverse.
4. *Eoscorpius typicus* n. sp., U. S. N. M. No. 37987, comb.
5. *Palaeobuthus* n. gen. *distinctus* n. sp., holotype, Peabody Mus. No. 133, reverse.

Plate II

Fig. 6. *Eoscorpius carbonarius* M. & W., Univ. of Illinois coll., obverse. Holotype.
7. *Palaeopisthacanthus* n. gen. *mazonensis* n. sp., holotype, U. S. N. M. No. 37977, obverse.
8. *Palaeopisthacanthus* n. gen. *schucherti* n. sp., holotype, Peabody Mus. No. 140, obverse.
9. *Palaeopisthacanthus* n. gen. *schucherti* n. sp., same, reverse.
10. *Eoscorpius granulosus* n. sp., holotype, Peabody Mus. No. 128, obverse.

Plate III.

Fig. 11. *Eoscorpius granulosus* n. sp., Peabody Mus. No. 129, reverse.
12. *Eoscorpius granulosus* n. sp., same, obverse.
13. *Mazonia woodiana* M. & W., holotype, Univ. of Illinois coll.
14. *Eoctonus* n. gen., *miniatus* n. sp. holotype, Peabody Mus. No. 131, obverse.
15. *Eoctonus* n. gen. *miniatus* n. sp., Peabody Mus. No. 132, obverse.

Plate IV.

Fig. 16. *Eoscorpius danielsi* n. sp., holotype, Daniels coll., obverse.
17. *Trigonoscorpio* n. gen. *americanus* n. sp., holotype, Daniels coll., obverse.
18. *Trigonoscorpio* n. gen. *americanus* n. sp., same, reverse

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Fig. 19. *Geralinura similis* n. sp., holotype, U. S. N. M. No. 37985 (1754 c), obverse.
20. *Geralinura similis* n. sp., same, reverse.
21. *Geralinura carbonaria* Scud., holotype, U. S. N. M. No. 37985 (1754a and b), obverse.
22. *Geralinura carbonaria* Scud., same, reverse.

Plate V.

Fig. 23. *Geralinura gigantea* n. sp., holotype, U. S. N. M. No. 37976, obverse.
24. *Geralinura gigantea* n. sp., same, reverse.
25. *Geralinura gigantea* n. sp., paratype, Peabody Mus. No. 147, reverse.
26. *Thelyphrynus* n. gen. *elongatus* n. sp., holotype, Daniels coll.
27. *Graeophonus carbonarius* (Scud.), holotype, U. S. N. M. No. No. 37969, obverse.
28. *Graeophonus carbonarius* (Scud.), same, reverse.
29. *Graeophonus carbonarius* (Scud.), U. S. N. M. No. 37964, obverse.

Plate VI.

Fig. 30. *Protophrynus* n. gen. *carbonarius* n. sp., holotype, Daniels coll., obverse.
31. *Protophrynus* n. gen. *carbonarius* n. sp., same, reverse.
32. *Protosolpuga* n. gen. *carbonaria* n. sp., holotype, Peabody Mus. No. 155, obverse.
33. *Kustarachne tenuipes* Scud., holotype, U. S. N. M. No. 37967, reverse.
34. *Kustarachne tenuipes* Scud., same, obverse.
35. *Kustarachne conica* n. sp., holotype, Daniels coll., reverse.

Plate VII.

Fig. 36. *Curculioides scaber* (Scud.), holotype, U. S. N. M. No. 37965, reverse.
37. *Curculioides scaber* (Scud.), same, obverse.
38. *Curculioides sulcatus* (Mel.), holotype, Univ. of Chicago No. 9235, obverse.
39. *Polyochera glabra* n. sp., holotype, U. S. N. M. No. 37981, obverse.
40. *Polyochera glabra* n. sp., same, reverse.

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Plate VIII.

Fig. 41. *Polyochera punctulata* Scud., holotype, U. S. N. M. No. 37971, obverse.
42. *Polyochera punctulata* Scud., same, reverse.
43. *Arthrolycosa antiqua* Harger, Peabody Mus. No. 162, obverse.
44. *Arthrolycosa antiqua* Harger, holotype, Peabody Mus. No. 161, obverse.
45. *Arthrolycosa danielsi* n. sp., holotype, Daniels coll., obverse.
46. *Arthrolycosa danielsi* n. sp., same, reverse.

Plate IX.

Fig. 47. *Trigonomartus pustulatus* (Scud.), holotype, U. S. N. M. No. 37984, obverse.
48. *Trigonomartus pustulatus* (Scud.), same, reverse.
49. *Trigonomartus pustulatus* (Scud.), Daniels coll., obverse.
50. *Trigonomartus pustulatus* (Scud.), same, reverse.
51. *Trigonomartus pustulatus* (Scud.), Peabody Mus. No. 168, obverse.
52. *Trigonomartus woodruffi* (Scud.), holotype, Brown Univ. coll.

Plate X.

Fig. 53. *Trigonotarbus schucherti n.* sp., holotype, Peabody Mus. No. 169, reverse.
54. *Trigonotarbus schucherti* n. sp., same, obverse.
55. *Trigonotarbus carbonarius* n. sp., holotype, U. S. N. M. No. 37978, reverse.
56. *Protopilio* n. gen. *depressus* n. sp., holotype, U. S. N. M. No. 37974, reverse.
57. *Protopilio* n. gen. *longipes* n. sp., holotype, Peabody Mus. No. 171, reverse.
58. *Areomartus* n. gen. *ovatus* n. sp., holotype, U. S. N. M. No. 1196, obverse.
59. *Heterotarbus* n. gen. *ovatus* n. sp., holotype, Daniels coll., obverse.

Plate XI.

Fig. 60. *Anthracomartus trilobitus* Scud., U. S. N. M., Lacoe coll. No. 1753d, obverse.

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Fig. 61. *Anthracomarthus triangularis* n. sp., holotype, U. S. N. M. No. 37968, obverse.
62. *Opiliotarbus elongatus* (Scud.), U. S. N. M. No. 3790, reverse.
63. *Opiliotarbus elongatus* (Scud.), same, obverse.
64. *Opiliotarbus elongatus* (Scud.), holotype, U S. N. M. No. 37970, reverse.
65. *Opiliotarbus elongatus* (Scud.), same, obverse.
66. *Metatarbus* n. gen. *triangularis* n. sp., holotype, Peabody Mus. No. 182, reverse.
67. *Metatarbus* n. gen. *triangularis* n. sp., same, obverse.
68. *Geratarbus lacoei* Scud., holotype, U. S. N. M. No. 37966, obverse.
69. *Geratarbus minutus* n. sp., holotype, Peabody Mus. No. 176, obverse and reverse.

Plate XII.

Fig. 70. *Discotarbus* n. gen. *deplanatus* n. sp., holotype, Peabody Mus. No. 174, obverse.
71. *Architarbus horribilis* (Mel.), holotype, Univ. of Chicago coll. No. 9322, obverse.
72. *Architarbus rotundatus* Scud., U. S. N. M. No. 37979, obverse.
73. *Architarbus rotundatus* Scud., Daniels coll., reverse.
74. *Architarbus rotundatus* Scud., holotype, Univ. of Illinois coll. No. 1116.
75. *Architarbus rotundatus* Scud., Univ. of Chicago coll. No. 9234, reverse.

Plate XIII.

Fig. 76. *Architarbus rotundatus* Scud., Univ. of Chicago No. 9233, reverse.
77. *Architarbus rotundatus* Scud., same, obverse.
78. *Architarbus rotundatus* Scud., Peabody Mus. No. 185, reverse.
79. *Architarbus rotundatus* Scud., same, obverse.
80. *Architarbus rotundatus* Scud., holotype of *Geraphrynus carbonarius* Scud., U. S. N. M. No. 37961 (Lacoe coll. No. 1701 a b), obverse and reverse.
81. *Architarbus minor* n. sp., holotype, Peabody Mus. No. 189, reverse.
82. *Architarbus minor* n. sp., same, obverse.

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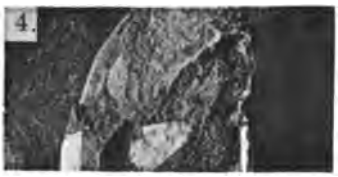

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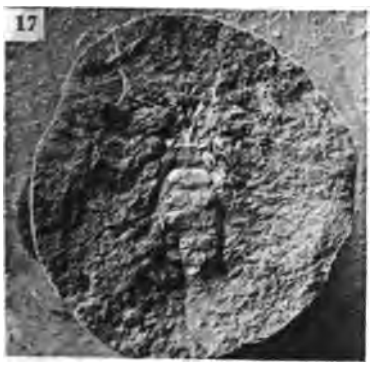
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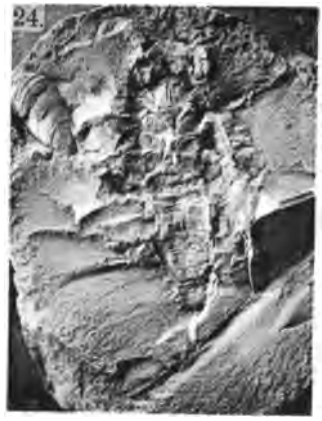
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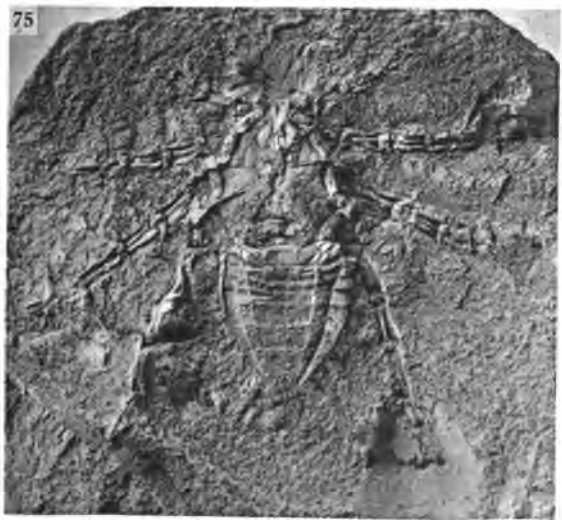
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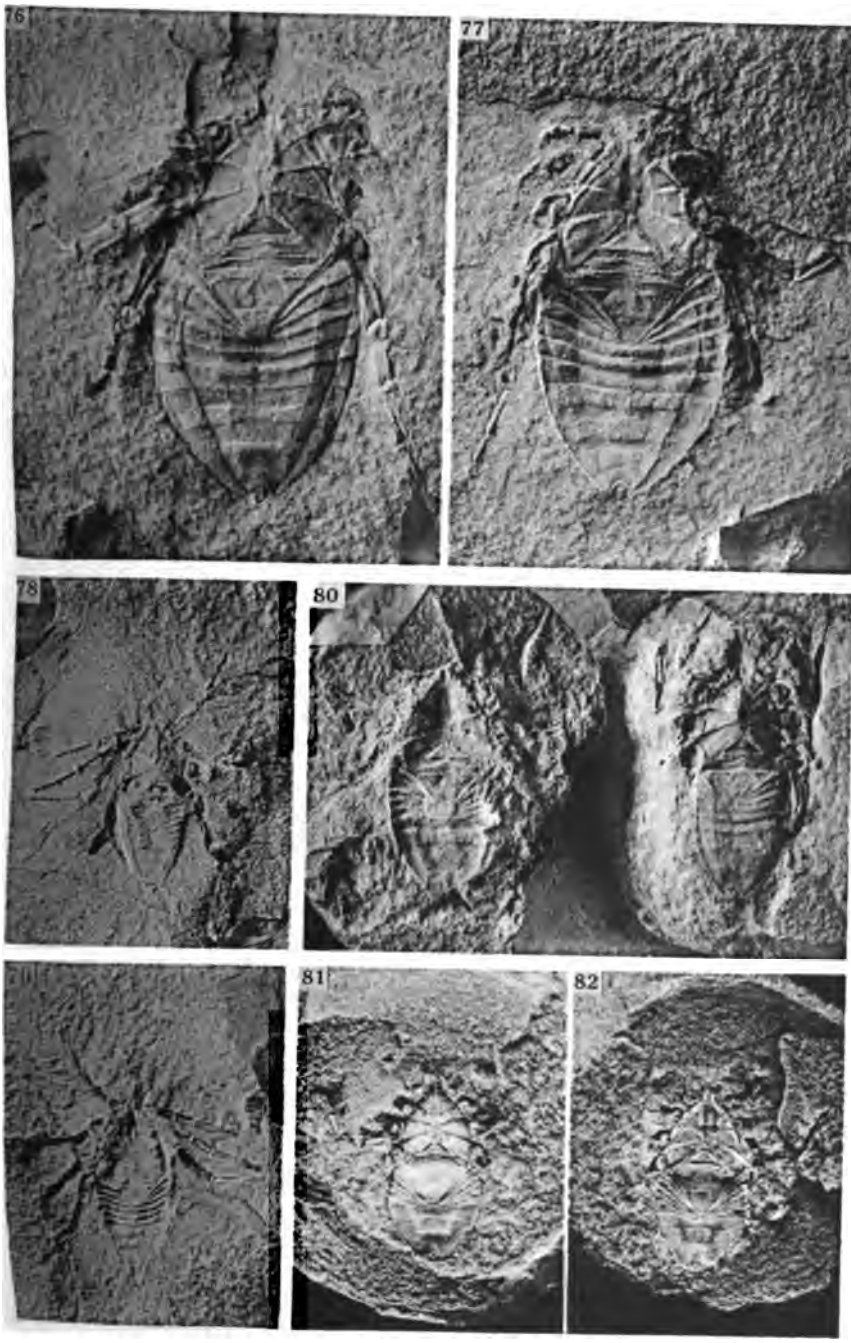

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TRANSACTIONS OF THE
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The Greek Diminutive Suffix -ΙΣΚΟ- -ΙΣΚΗ-

BY

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II.—THE GREEK DIMINUTIVE SUFFIX -ΙΣΚΟ- -ΙΣΚΗ-

I. ITS RELATION TO THE SAME SUFFIX OF OTHER LANGUAGES.

1. The diminutive suffix -ισκο- -ισκη-, whatever we may say of its ultimate origin, was fully developed in all its principal meanings at the earliest periods of the Greek language as known to us. Though not found in Homer, it does not follow that its development was post-Homeric, nor are we justified in saying that its origin was later than "diminutive" -ιον for this reason. Its absence in Homer is explained by the Aeolic ground-work of the poems, the suffix apparently not being found in any of the Aeolic documents, while in the other dialects it appears in the very earliest sources, e. g. in Alcman for the Doric, and Hipponax and Herodotus for the Ionic.[1] Since these earliest occurrences show fully developed "diminutive" meanings, it follows that almost the whole semantic development has taken place in pre-literary times, and the problem before us is to determine in what relation these resulting meanings stand to the meanings of the same suffix in other languages and the parent language.

2. That -ισκο- is an Indo-European suffix,[2] and not a purely Greek conglutination, is made evident by the large number of languages which have it in some use or other. Even if we omit the Balto-Slavic -iszka- -ьszka-, which may possibly be a Germanic borrowing,[3] there are left to compare with the Greek both a few Latin adjectives like prīscus < *pri-iscus and mariscus, the Keltic proper names like Taurisci, and the many Germanic adjectives in -iska-, e. g. Goth. þiudisks, so that I. E. -isko- occurs in at least four, more probably five language branches.

3. But although the suffix itself is thus certainly Indo-European, it is quite uncertain just what its meaning was, or whether it formed derivatives only from adjectives or also from substantives or whether it was itself an adjective or substantive suffix or both, since the languages in which it occurs vary widely in these respects. Thus in Greek and Keltic it forms only substantives, in the Germanic

[1] On -ισκο- in the Aeolic and the earliest Lyric poetry see p. 201 f. of the writer's Greek Diminutives in -ιον, Weimar 1910, cited after this by the abbreviation "Gr. Dims."

[2] Cf. Brugmann, Gr. 2. 1². 501 ff.

[3] Cf. Brugmann, op. cit. 502.

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and Lithuanian only adjectives, in the Latin and the Slavic languages both adjectives and substantives. In Greek the primitive is likewise almost always a substantive, probably also in the Keltic, in Latin the few extant examples come from adjective primitives,[1] e. g. mariscus : mās, while in Germanic derivatives from both substantive and adjective primitives occur, though the former predominate. From the latter we have e. g. O. H. G. altisc : alt, English reddish : red. As to the meaning of the suffix the languages again diverge widely, the differences largely following from those preceding. In Greek -ισκο-, to anticipate results somewhat, expresses similarity and forms substantives with deteriorative, diminutive, and hypocoristic meanings. In Latin the three native examples quoted by Brugmann all show the meaning "having the nature of" : prīscus < *pri-iscus 'of a nature belonging to formerly,' i. e. 'primitive,' mariscus 'of a male nature,' 'masculine,' lentiscus (: lentus) 'of a tough nature,' a name of the mastic-tree, referring to the toughness of its resin. In the Keltic we find e. g. Ταυρίσκοι, a people 'coming from the mountains,'[2] and other names of peoples as well as neuter geographical names like Viviscum, which though largely obscure as to their motive of formation, yet probably showed the same suffixal meanings as the similar Germanic words. In the latter branch the meaning was originally 'of the nature of,' 'like,' 'coming from,'[3] but the suffix gradually extended its sphere so as to allow other meanings, e. g. 'belonging to' in locutions like the German "die erzieherischen Missgriffe."[4] In the Lithuanian[5] the usage is like the Germanic, while in the Slavic[6] languages these same adjectival meanings occur as well as substantives classified as deteriorative and amplificatives, particularly in the Polish. A further difference is found between the Greek and Slavic, which both show 'diminutive' mean-

[1] From the adverb *pri, however, is derived prīscus.

[2] Cf. Pape s. v.

[3] Cf. Wilmanns, Deutsch. Gram. 2. 468; Brugmann, loc. cit. When these two scholars mention appurtenance ("Zugehörigkeit") as being among the primary meanings of the suffix they seem to refer to such words as Goth. judaiwisks, which, though originally conceived as 'having the nature of or coming from the Jews,' may also have been thought of as 'belonging to the Jews or Judea.' We have indeed the roots of the meaning of appurtenance, but want of unambiguous cases in the Gothic at least shows that it was not as yet consciously felt.

[4] Cf. Wilmanns, op. cit. 469.

[5] Cf. Leskien, Bild. d. Nom. 372.

[6] Cf. Belič, Arch. f. sl. Phil. 23. 179 ff.

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ings, in as much as the Slavic words are neuters, while the Greek ones follow the gender of their primitives.

4. In order to determine the relation of these widely divergent uses it will be necessary to come to an understanding as to the origin of -isko-, and then we may draw conclusions as to the earliest stratum of usages. We may divide the various attempts to solve this problem into two groups. In the first place some earlier scholars, recognizing the fact that the designation of likeness was the principal characteristic of -isko-, and that the 'diminutive' meanings could easily be developed from this, sought to find some word suggesting the meaning 'like' from which the suffix could have arisen. Pott, Etym. Forsch. 2. 881, and Benfey, W. L. 1. 235, suggested the Skt. root īkṣ 'to see' 'to view' as its origin, though the short i of the suffix as opposed to the long one of īkṣ [1] would now be regarded as definitely disposing of that derivation. The further comparison of Gr. εἴκω,[2] which had a digamma, will moreover harmonize neither with the suffix -isko- nor the Skt. īkṣ, and εἴκω and the latter furthermore disagree in their vocalism, since īkṣ is a reduplicative formation to the root akṣ [3] which appears only with o as root-vowel, while the Greek word belongs to the vowel series i/ei/oi. Somewhat similar is the statement of Schweizer, KZ. 3. 383: "das gr. -ίσκος, auch -ίχος ist samt den übrigen oder abgetrennt von ihnen als verbal 'darin sehend, ähnlich' zu erklären, und mit inchoativem -σκω auf Skt. aksh zurückzuführen." The i for Skt. a, however, would make this as impossible as the comparison of -īkṣ.

5. According to Bopp, Vgl. Gr. § 952, who is followed by Schwabe, De Dim. Graec. et Lat. 50, -isko- is a simple suffix and the s is added for euphony's sake. This theory, of course, nowadays scarcely requires mention, since we are not so ready as Bopp to assume euphonic insertions without knowing their cause or origin. For phonetic reasons also Vondrák's derivation of Slav. -isko-, Vgl. Sl. Gr. 1. 468 f., is to be discountenanced. He assumes that it is a conglutination of -isto- (with original long ī) and -ko-, i. e. < -ist-ko-. We would not, however, expect the o of -isto- to be dropped before a consonant. Moreover, Vondrák takes the -isto- to mean

[1] What Benfey, op. cit. 234 f., has to say concerning the relation of the quantities, is admittedly a mere conjecture.

[2] Really two series of words are here confounded: *εἴκω* 'I yield' and *εἰκών* 'image' *ἔοικα* 'I am like.' The latter were of course in mind. Cf Prellwitz s. v. *εἴκω* and *εἰκών*.

[3] Cf. Uhlenbeck, Etym. Wörterb. s. v. īkṣate.

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'provided with,' and this is contrary to the use of -isko-, which does not seem to have that meaning.[1]

6. Much more probable from every point of view than any derivation so far mentioned is the one first advanced by Leo Meyer, KZ. 6. 381 f., and adopted e. g. by Brugmann, Gr. 2. 1². 503. According to this theory -isko- is a conglutinate the last part of which is the common I. E. -ko- suffix, while the first is the comparative suffix, the weak grade to the strong -ies- -ios-,[2] which is also found in the superlative suffix Skt. -ista- Gr. -ιστο- Goth. -ista-. As to Vondrák's contention that for the Slavic -isko- the long i beside -ьsko- is an objection, Belič, Arch. f. sl. Ph. 23. 179, has shown how the i could be derived from contraction of an ь of the stem and the ь of the suffix -ьsko-, and could then be extended by analogy. Vondrák's second objection that the meaning of the Slavic suffix is against connection with Gr. -ισκο- is also of course not meant to affect the Gr. suffix itself nor I. E. -ĭsko-, nor is it serious even for Slav. -isko- when Brugmann's explanation of the semantic development is more closely scrutinized.

7. According to the latter (l. c.) we are to start from the use of the comparative degree in adverbs in the sense 'coming relatively close to the condition designated by the adjective,' e. g. Germanic *alþiz 'approximately old.' Adding to this the common I. E. adjectival suffix -ko-,[3] no change of meaning except return to adjectival function would result, and O. H. G. altisc would have also been originally 'rather old.' This being the case, -isko- would easily be felt as a unity and abstracted as a single suffix. After this was once done, it was easy to form derivatives from substantives with the same suffix, e. g. Goth. mannisks : manna. In Greek, on the other hand, the derivative adjectives were themselves substantivized, νεανίσκος originally formed from *νεανός 'young,' meaning 'rather young,' was referred to νεανίας after first having been substantivized as 'he who is rather young,' and so became a diminutive to it.

[1] Vondrák, however, would derive from it augmentatives and words like bičiště 'Peitschenstiel' : bič 'Peitsche.'

[2] A support for the contention that the -is- of -isko- is derived from the comparative -ies- -ios- is found in the habits of sandhi of Gr. -ισκο-. When e. g. heavy suffixes like -ευ- in ἀμφορεύς disappear completely in the formation of diminutives like ἀμφορίσκος (cf. § 12), the most rational explanation seems to be that -ισκο- has retained to a limited extent the habits of the comparative suffix, which, being originally a primary suffix, was added to the root instead of the nominal stem. Cf. Brugmann, Gr. 2. 1². 656.

[3] Cf. Brugmann, Gr. 2. 1². 482 f.

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8. According to Brugmann, then, the oldest use of the suffix was to form adjectives from adjectives with the meaning 'approximating the condition designated by the primitive.' If -is- is really the comparative suffix there is no doubt that the primitive must have originally been an adjective, and that the force of the suffix must have been as described. At first sight, however, the statement that the earliest stratum of words in -isko- must have come from adjective primitives seems to be in contradiction to the state of affairs in the actual languages, since only in the Latin and the Germanic certain adjective primitives are found, and in the Latin the whole category comprises only three words, while in the Germanic words like O. H. G. altisc are really very rare compared to the large number formed from substantive primitives. But we must bear in mind that of the three language groups in which the suffix is frequent, each has followed its own line of development, the Greek usage (diminutives) is widely different from the Germanic (adjectives of likeness and descent), while the Slavic again partakes of the nature of both, and moreover, borrowing of some uses from the Germanic is suspected.[1] Probably, therefore, the productivity of the suffix is due to causes affecting these individual language groups, while the parent language was rather on the stage of the Latin, i. e. it had only a few words[2] ending in the suffix, and these entirely or predominatingly derived from adjectives.

9. I should, however, take exception to Brugmann's statement that the conglutinate in the beginning formed only adjectives.[3] Though the -is- must have been added to an adjective primitive, yet the -ko- was from I. E. times a substantival[4] as well as an adjectival suffix. Consequently Lat. lentiscus 'mastic tree' was not necessarily an original adjective, but was from the beginning a *thing* which was 'rather tough,' and Gr. νεανίσκος could from the beginning have been '*he* who is rather young' (: *νεανός) as well as have been 'rather young' and secondarily substantivized. We should therefore really extend Brugmann's statement to the effect that -isko- in I. E. times formed substantives as well as

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[1] Cf. Brugmann, op. cit. 502.

[2] Just what these were is totally uncertain. There is not a single word in -isko- which occurs in several language groups, and thus would allow us to assume I.E. origin.

[3] Op. cit. 503.

[4] Cf. Brugmann, op. cit 669; for the Skt. Whitney, Skt. Gram.[3] 1222.

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adjectives in which it designated an approximation to a state or quality designated by a primitive adjective.

10. The extension of the use of the suffix -isko- to form derivatives from substantives could take place after it was felt as a single suffix.[1] On the one hand there might be an adjective and a substantive coexisting from one and the same stem as possible primitives, e. g. *νεανός and νεανίας, and νεανίσκος, though formed from the adjective could be referred to the latter ; or perhaps some word like the proper name Ἀγρίσκᾱ, an epithet of Athena, originally derived from an adjective, in this case ἄγριος 'field-like' 'wild,' could be referred to a noun, e. g. ἀγρός 'field,' and κυκλίσκος, originally a synonym to κύκλιος, could have been referred to κύκλος, etc. There are, however, very few if any cases where the derivation from such an adjective is more natural than from a substantive, and yet both are possible, and we may assume that the chief cause of the transfer of the suffix to the substantive primitives was semantic syncretism. When e. g. an I. E. adjective like O. H. G. altisc meant 'rather old' (§ 7), -isko- was identical in meaning with -ko- in words like Skt. babhru-ká-s 'brownish' i. e. 'rather brown,' or νεανίσκος 'he who is rather young' would have an -isko- exactly like the -ko- of Skt. rohítaka- (: róhita-s 'red') 'that which is rather red,' the name of a certain tree.[2] Since -ko- was also widely used to form derivatives from substantives, -isko- followed with ease.

11. Partially by the same process of syncretism -isko- took on to itself widely divergent meanings in the different languages, but at the same time it could on its own accord pass through a semantic development which was much like that of -ko-, which itself started from the meaning 'belonging to the category of' 'being like,' and in some languages, e. g. Skt., ended by having a large variety of meanings.[3] Consequently we may often not be sure whether a certain use was influenced by simple -ko- or not, nor is a common usage in different languages by itself a guarantee of common origin. Thus -isko- may be deteriorative in Greek, Slavic, and Germanic, but the Greek deterioratives, like the other 'diminutives,' seem to be due to syncretism with -ko-, since their gender, like that of the -ko- diminutives,[4] follows that of the primitive, while the Slavic neuters must be due to a secondary development

[1] Cf. Brugmann, op. cit. 503.

[2] Cf. Edgerton, JAOS. 31. 118.

[3] Cf. Brugmann, op. cit. 503 f.; Edgerton, JAOS. 31. 96 f.

[4] Cf. Brugmann, op. cit. 669.

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from the adjectives through the meaning 'like, but not equivalent to,'[1] since the neuter gender of diminutives argues their origin from substantivized adjectives.[2] The German deterioratives like kindisch and weibisch again have no connection with either the Greek or Slavic, but are of demonstrably late origin,[3] and must have been patterned after words like 'bäuerisch,' in which the deteriorative element comes from the primitive.[4] Similarly the meaning 'coming from,' which is productive in Germanic and Slavic adjectives, and might be conceived as due to syncretism with -ko-, is explained by Brugmann, Gr. 2. 1². 666, as a new independent development in words like O. H. G. irdisc, originally 'of an earthly nature,' but in many combinations easily conceived as 'coming from the earth.' It is the concern of the grammar of the different languages to determine the relation of their own usage to the I. E. original, and we may henceforth confine ourselves to the problem of the origin of the Greek uses.

II. ITS SANDHI, ACCENT, AND GENDER.

12. About the combination of -ισκο- -ισκη- with the stem-finals little need be said. Practically the whole thing can be summarized in one statement: The final two syllables of any combination of stem-suffix and -ισκο- -ισκη- result in -ισκο- -ισκη- with short ι,[5] as is shown by the fact that the accentuation of the masculines is always -ίσκος, whereas a contraction of -ι-ίσκος > -ῑσκος would have been revealed by the circumflex accent in the nominative and accusative, e. g. -ῖσκος. The suffix, then, was ordinarily added to consonant stems: Ἀνδρίσκος : ἀνδρ-, χηνίσκος : χήν, μειρακίσκη : μεῖραξ, ποδίσκος : ποδ-. The stem-finals ο, η/ᾱ, ι, ιο, ιᾱ, ειο,[6] υ, ευ were dropped or elided before -ισκο-[7] : ἀνθρωπίσκος : ἄνθρωπος, λεκανίσκη :

[1] So Belič, Arch. f. sl. Phil. 23. 151.

[2] Cf. Brugmann, l. c.

[3] Cf. Wilmanns, op. cit. 469.

[4] Cf. Brugmann, op. cit. 683.

[5] That e. g. *-ισκο-* almost never contracts with a stem-vowel to form *-εισκο-* is mentioned by Choeroboscus Anec. Ox. 2. 268 *οὐδέποτε τὸ σκ ἐν συλλήψει ὄντα ἔχουσι τὴν ει δίφθογγον προηγουμένην, χωρὶς μιᾶς λέξεως καὶ ταύτης ἀμφιβαλλομένης· οἷον, Ἡρακλεῖσκος Ἡρακλεῖσκος· παραδείγματα δὲ ταῦτα· βασιλίσκος· μειρακίσκος.* Similarly Herodian 2. 445. 19.

[6] *-αιο-* on the other hand seems to have lost only the *ιο*, but not the *α*: *Ἑρμαΐσκος* : *Ἑρμαῖος*, *Ἡραΐσκος* : *Ἡραῖος*. For *Ἰρανίσκος* (probably not : *Εἰρηναῖος*) cf. § 105.

[7] For the probable cause of this see note to § 6.

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λεκάνη, δερρίσκος : δέρρις, μειρακίσκος : μειράκιον, οἰκίσκη : οἰκία, χελίσκον : χέλειον, πηχίσκος : πῆχυς,[1] βασιλίσκος : βασιλεύς, ἀμφορίσκος : ἀμφορεύς. The σ stems followed the analogy of the vowel stems, since the loss of the σ in the majority of forms and the subsequent contraction of vowels caused their suffix to be no longer felt as the stem-final : therefore : σφελίσκον : σφέλας, σκελίσκον : σκέλος, μελίσκον : μέλος. -ω- stems on the other hand seem to have retained their ω and added -ισκο- of two full syllables : Ἡρωΐσκος : ἥρως. In several instances consonant suffixes were also dropped : κυλίσκη[2] (by haplology for *κυλικίσκη?) : κύλιξ, and regularly -ιδ-, e. g. σανίσκη : σανίς, κοπίσκος : κοπίς. We may assume that words like λεκανίσκη : λεκάνη, but with λεκανίς existing alongside, sometimes caused the word in -ίσκο- to be referred to the primitive in -ις, and the others followed by analogy.[3] The reason for the preference of the short form lay in the avoidance of awkward forms like *κοπιδίσκος. More obscure is τριμίσκος : τρίμιτος, though possibly the word in -ιτο- could have dropped the το by analogy to words in -ιδ-. For Κυβερνίσκος : κυβερνήτης see note to § 103 A. Finally there are several cases of the dropping of an n suffix before -ισκο-. So certainly the Plautine Olympiscus and Lampadiscus, which act as living 'diminutives' to Olympio and Lampadio (§ 102.) Probably also Μενίσκος : Μένων. The cause for this again may have been the existence of a collateral form with an n suffix alongside of the real primitive without it, e. g. the existence of Παρμένων beside Παρμένιος, so that Παρμενίσκος could be referred to the former instead of the latter. Similarly Ποθίσκος : Πόθος could be referred to Ποθίων, and cause by analogy Λαμπαδίσκος : Λαμπαδίων, etc. Yet in view of the fact that all of these words are proper names it seems more probable that our suffix has taken upon itself the function of forming "Kosenamen" or shortened forms of proper names. Cf. Brugmann, Gr. 2. 1². 119. Certain of this we are for two compound names the last component of which is almost entirely suppressed before the -ισκο-: Παρμίσκος : Παρμένων and Πανταλίσκος : Πανταλέων. See § 105.

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[1] On the other hand *μυΐσκος : μῦς, θυΐσκος : θύος*, where the *υ* is part of the root. Influence of other words in *-ίσκο-* prevented the contraction of *υι* > *ῡ*. *θύσκη* in Hesychius, however.

[2] Janson, De Graeci Sermonis Dem. in *ίσκος* 6, assumes **κύλη* as primitive, though that it hardly necessary.

[3] These words were certainly not syncopated, as is assumed by Janson, op. cit. 4, for *χλανίσκιον*.

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13. That the accent of -ισκο- -ισκη- is invariably on the penult has been something of a mystery in view of the fact that neither the quantity of the ultima, which is short in the masculine and neuter, nor the ending -σκο- demands that accentuation.[1] Moreover, the -is-, being the weak form of the strong -ies-, must certainly have been unaccented originally. Of no importance is the analogy of ἐγώ,[2] which when in composition with γε retracts its accent to the first syllable (ἔγωγε not *ἐγῶγε); for the contrast of ἐμέγε shows that it is due to the Attic 'law of the properispomena' (⏑ ~ = became ⏑ – =), for which cf. Vendryes, Mem. 13. 218ff. But by all means the accentuation of the ι must be secondary and due to a development within the Greek itself.

14. As to its cause, Allinson, A. J. of Ph. 12. 53, 56, maintains that the language had a tendency to accent the penult of diminutives, and that this could be the only reason why -ίσκο- was so accented. Similarly Hatzidakis, Glotta 1. 124, declares that the diminutives in -ίσκο-, having a variable gender, were patterned after those in -ύλος, -ίλος, and -ίχος, which also had two genders, and that in all of these cases the diminutive meaning had something to do with the accentuation of the suffixes. If, however, such a tendency really existed, it must itself be explained, for it is certainly neither anything inherent in the nature of a diminutive nor an I. E. tendency, and a further difficulty lies in the fact that the only larger body of diminutives which is regular in the application of this rule comprises these words in -ίσκο-, which are most difficult to explain, while -ιον is not so accented under all circumstances,[3] and the other categories comprise only small groups, largely dialectical at that, and hardly fit to give rise to a large pan-Hellenic category. It will therefore be better to search for a common cause which can explain -ίσκο- as well as -ύλο-, -ίλο-, and -ίχο-. And this seems to me to lie in the influence of the feminine on the masculine and neuter, an influence which could, of course, not be found in the invariably neuter -ιον. While therefore there was no force to change πόδιον to *ποδίον, a word like μειρακίσκος 'lad,' even if originally accented *μειράκισκος, would be perpetually associated with the feminine μειρακίσκη 'lass,' whose accent could not go back as far as the antepenult because of the long ultima, and consequently the accent had a tendency to become leveled. Since the feminine was precluded from being assimilated to the

[1] Cf. Hatzidakis, Glotta 1. 124.

[2] Cf. Allinson, A. J. of Ph. 12. 56.

[3] Cf. Gr. Dims. 10 ff.

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masculine because of the long ultima, the change took place in the reverse direction. It must be borne in mind too that only a few cases were affected: the nom. sing. μειρακίσκος, the acc. μειρακίσκον, and the nom. pl. μειρακίσκοι, while the long ultima of all the other cases, e. g. the gen. sing. μειρακίσκου, caused the masc. and fem. to agree from the beginning. Similarly ἀρκτύλος could have followed *ἀρκτύλη, etc. After the masculine had followed the feminine, the neuter in -ίσκον in turn followed the masculine. For -ίσκο- this tendency might also have been helped by primitives in -ίς, e. g. κοπίσκος after κοπίς, though it does not seem that this could have been of great importance.

15. The question whether the old accentuation of -ισκο- has left any traces in the Greek language may be answered in the negative. The only possible case of an appellative with the accent on either the ultima or propenultima is χέλισκον (Hipp. ap. Erotian. p. 137 Klein), but the fact that the text is suspected also for other reasons should not make us place too much faith in it. On the other hand it would certainly be conceivable that a word which had lost completely all association with any primitive (it designated a kind of pot, see § 41 A) should have resisted the tendency to change the accent to the penult, since it was by all means not felt as a diminutive. Other examples of irregular accentuation of the suffix are all non-Greek proper names, which therefore do not concern us. I might mention the Thracian river Ἀρτισκός,[1] the Dacian river Τίβισκος, the Dacian town Τίρισκον, the Parthian town Φίλισκον.

16. The gender of words in -ισκο-, which may be either masculine, feminine, or neuter, like that of the I. E. -ko- and -lo- diminutives, followed the gender of their primitives[2]: ὁ ὀβελίσκος : ὁ ὀβελός, ὁ νεανίσκος : ὁ νεανίας, ἡ παρθενίσκη : ἡ παρθένος, ἡ κορίσκη : ἡ κόρη, ἡ οἰκίσκη : ἡ οἰκία, τὸ μελίσκον : τὸ μέλος, τὸ σαμβαλίσκον : τὸ σάμβαλον. When, however, we count the extant words in the suffix we find that the masculines are overwhelmingly predominant,[3] the feminines are much less frequent, and the neuters are exceedingly rare. In round numbers there are found considerably over two hundred masculines, about forty feminines, and only about a dozen neuters.

17. This preponderance of the masculine is not due to any extended tendency to form masc. derivatives in -ισκος from fem. and neut.

[1] Also in the form Ἀρτησκός.

[2] Cf. Brugmann, op. cit. 669 f.

[3] Cf. Schwabe, De Dem. Graec. et Lat. 50.

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primitives (cf. § 22 ff.), but seems rather to be attributed to the accident that most of the groups in which the suffix became productive largely consisted of derivatives from masc. primitives. After that gender had once become dominant new feminine and neuter formations no longer seemed familiar, and this in turn reacted to make the masculine more dominant still. As far as the neuter is concerned the competition of words in -ιον was a particular reason for avoiding the -ισκον. Sometimes this resulted in forming -ισκιον [1] rather than -ισκον, at other times it meant that of the two principal possible diminutives the one in -ιον was formed rather than the one in -ισκον.

18. The extreme rarity of the neuters led some scholars to deny their existence altogether.[2] When an indisputable form like the plural ἀσκερίσκα occurred they spoke of a metaplastic plural, and otherwise they assumed a corrupt text and substituted forms in -ισκιον (e. g. μελίσκιον Alcm. 65) or -ισκος (τὸν σανδαλίσκον Ar. Ran. 406). That they were mistaken, however, is shown by six forms which can not be interpreted otherwise than as neuters except by the above devices. One of these is Doric, namely the above mentioned μελίσκον, and five Ionic : ἀσκερίσκα and σαμβαλίσκα, acc. pl., Hipponax ; καννα βίσκα, acc. pl., Herondas ; σπληνίσκον, nom. sing., Insc. Samos 346–345 B. C. ; σφελίσκον, nom. sing., loc. cit. Probably also χέλισκον (Hippocrates), but the irregular accent and suspicions of corruption of the text make it dubious.[3] In the Attic dialect there are no certain examples, but two highly probable ones, in the first place κρεΐσκον, Alexis frg. 3. 472, where Porson conjectured τριωβόλου κρεΐσκον instead of τριωβολοκρεΐσκον, but whatever reading we adopt, the following neuter adjective τέρεν makes it easier to take the word as a neuter than as a masculine.[4] Equally probable is σανδαλίσκον, Ar. Ran. 406, in the verse κἀπ' εὐτελείᾳ τόδε τὸ σανδαλίσκον. The mscs. have the unmetrical τόνδε τὸν σανδαλίσκον. Bentley conjectured τόν τε σανδαλίσκον, but Blass better as above, which differs from the textus receptus only by the omission of the two ν's, i. e. much less than Bentley's conjecture, and at the same time does not assume a masculine derivative from a neuter primitive which would otherwise be hard to

[1] Cf. Gr. Dims. 252 f.

[2] So e. g. Schwabe, l. c.; Janson, op. cit. 3 f., De Graec. Serm. Nom. Dim. et Ampl. 65; Leo Meyer, KZ. 6. 381.

[3] See note to *χέλισκον* § 41 A.

[4] L. and Sc. e. g. give the words as masculine, while Meineke, in order to avoid the neuter in *-ισκον*, would substitute *κρεΐσκιον*.

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explain. The existence of all of these forms in -ισκον should make us dubious about invariably counting as masculines those forms from neuter primitives of which the gender can not be determined. Thus the acc. sing. λεκίσκον (: τὸ λέκος) in the Ionian Hippocrates and the gen. pl. σαμβαλίσκων (: σάμβαλον) in Herondas are certainly neuter rather than masculine, probably also the dual ζυγίσκω in an inscription from Eleusis,[1] though the fact that there are no certain examples of the neuter in Attic would make any conclusion doubtful, as are also the following forms in literature : γαμματίσκοις (: γάμμα) Jo. Laur. De Magistr. Reip. Rom. 2. 4, πτερίσκοις (: πτερόν) Babr. 118. 5, σκελίσκοιν (: τὸ σκέλος) Ar. Eccl. 1167.

19. The residue of certain or probable masculine derivatives from feminine or neuter primitives is exceedingly small, and no larger proportionately than aberrations of gender in other directions. All of these changes, moreover, can be explained as caused by the same forces and will be treated to-gether.

20. When it was stated that the gender of words in -ισκο- followed that of the primitive several classes of exceptions were ignored. In the first place it is evident that names of persons must follow the natural gender regardless of the gender of their primitives. While τὸ μειράκιον could itself be neuter because that was the regular gender for substantivized adjectives of all kinds, and there was no corresponding masculine form to be had, yet from this word could come only μειρακίσκος, not *μειρακίσκον, since a form in -ισκο- grammatically characterized as masculine was available. This applies particularly to proper names,[2] the gender of which depends altogether on the sex of the person to whom they are applied. Thus from ὁ λύκος comes indeed Λυκίσκος when a man is designated, but Λυκίσκᾱ for a woman, from ὁ ἀγρός comes Ἀγρίσκᾱ, an epithet of the goddess Athena, from the neuter τὸ μέλος Μελίσκος, from τὸ μῦρον Μυρίσκος.

21. Moreover, when the derivative is not a living 'diminutive,' being either faded or with a suffix expressing likeness or perhaps appurtenance from the beginning, the derivative would not be in as close touch with its primitive as with its congeneric words, and would consequently be disposed to follow the gender of the latter. Thus κοπίσκος 'a pastille' followed the gender of the congeneric τροχίσκος and κυκλίσκος rather than of its primitive ἡ κοπίς 'chopper,' and κανναβίσκον 'a shoe made of hemp' followed σαμβαλίσκον (: τὸ σάμβαλον) rather than its primitive ἡ κάνναβις. Congeneric attrac-

[1] Cf. the editor's note Arch. Eph. 1899 p. 184.

[2] Cf. Janson, op. cit. 68.

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tion would, however, not be limited to such cases, but even where, as in 'diminutives,' primitive and derivative are in closer connection it might take place, so e. g. ἀσκερίσκον diminutive of ἀσκέρᾱ a kind of shoe, neuter instead of feminine because of τὸ σαμβαλίσκον. Moreover, this shift of gender must not necessarily be caused by another word in -ισκο-, though such words would be most closely associated, but any other word could do the same. Particularly often the genus influenced the species.[1] So μυΐσκη 'a small sea-muscle' : ὁ μῦς after κόγχη or τελλίνη, ῥοΐσκος 'a tassel or knob shaped like a pomegranate' : ἡ ῥόα after θύσανος 'tassel.' Also the proper names Δορίσκος : τὸ δόρυ after ὁ αἰγιαλός 'beach,' Ἐργίσκη : τὸ ἔργον after ἡ πόλις or ἡ πολίχνη 'city,' and perhaps Ζαλίσκος : ἡ ζάλη after ὁ ποταμός 'river.' Below I group all cases of attraction of gender to-gether, classifying according to the direction in which the gender was influenced.

22. A. *Masculines from feminine primitives.* ἀσπιδίσκος 'a boss' : ἡ ἀσπίς, after ἀστραγαλίσκος (cf. Hes. sub φάλαρα), δερρίσκος 'a (small?) leather covering or coat' : ἡ δέρρις after χιτωνίσκος or τριμίσκος, Ζαλίσκος (name of a river) if : ἡ ζάλη (cf. § 95 n.) after ὁ ποταμός 'river,' κοπίσκος 'a pastille' : ἡ κοπίς after τροχίσκος and κυκλίσκος, λοπαδίσκος 'a flat dish or plate' : ἡ λοπάς after πινακίσκος, μηνίσκος 'crescent' : ἡ μήνη and σεληνίσκος 'crescent' : ἡ σελήνη after ὁ κύκλος or κυκλίσκος, ῥοΐσκος : ἡ ῥόα (§ 21), probably also παραγωνίσκος 'a carpenter's square' : ἡ γωνία after names of tools like μοχλίσκος, στυλίσκος, and τορνίσκος. Perhaps originally also ὁ σινδωνίσκος 'a garment made of fine cloth' : ἡ σίνδων after χιτωνίσκος. In its only occurrence, however, σινδωνίσκος is used with a feminine adjective (§ 69), probably a secondary development due to the reverse influence of ἡ σίνδων.

23. B. *Feminines from masculine primitives.* μυΐσκη : ὁ μῦς (§ 21), Τριποδίσκη (name of a village) : ὁ τρίπους after ἡ κώμη.

24. C. *Masculines from neuter primitives.* γραφίσκος (a surgical instrument) : τὸ γραφεῖον after the same group as παραγωνίσκος (§ 22), Δορίσκος (name of a beach) : τὸ δόρυ after ὁ αἰγιαλός, θυΐσκος 'a censer' : τὸ θύος after many names of vessels, e. g. καδίσκος and κοτυλίσκος, καρυΐσκος 'a nut-like vessel' : τὸ κάρυον, like θυΐσκος, κεντρίσκος 'a kind of fish' : τὸ κέντρον after names of fish like γλαυκίσκος, δελφινίσκος, and κεστρινίσκος, ληνίσκος[2]

[1] Cf. Brugmann, Gr. 2. 2[2]. 92.

[2] The acc. sing. *ληνίσ[κον]* in the Attic inscription of Ditt.[2] 633. 25 is probably masculine because the word is otherwise certainly masculine, e. g. the acc. pl. *ληνίσκους* in Hesychius.

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'a woolen band or riband' if: *λημνίον (cf. διλήμνιον) after στεφανίσκος, λινίσκος 'fine linen': τὸ λίνον[1] after *ὁ σινδονίσκος (§ 22) or χιτωνίσκος, μαγαρίσκος 'Megarian pottery': τὰ Μάγαρα = Μέγαρα after πινακίσκος etc., παραβολίσκος: τὸ παράβολον if 'little images' probably followed ἀνδριαντίσκος or the generic ὁ τύπος, but if 'projection' rather ἀστραγαλίσκος etc. τρυπανίσκος 'a borer': τὸ τρύπανον[2] after the same group as παραγωνίσκος (§ 22). If σκελίσκος 'little leg' (§ 18) is right instead of σκελίσκον (: τὸ σκέλος), it was influenced by ποδίσκος.

25. D. *Feminines from neuter primitives.* Ἐργίσκη (name of a town): τὰ ἔργα after ἡ πόλις or πολίχνη, θυΐσκη 'a censer': τὸ θύος after κοτυλίσκη, κυλίσκη, λεκανίσκη, ὑδρίσκη, or φιαλίσκη.

26. E. *Neuters from feminine primitives.* ἀσκερίσκον: ἡ ἀσκέρα and κανναβίσκον: ἡ κάνναβις, both designating shoes, after σαμβαλίσκον.

27. It will thus be seen that all cases of aberration of gender from that of the primitive can be explained without assuming a tendency of masculines to take the place of feminines and neuters. In addition to the principles applied above it may be that the existence of a double primitive or a primitive with uncertain gender sometimes was a contributing factor to causing aberration of the derivative, though there is no evidence that it was strong enough by itself. Thus the fact that φθοΐσκος could be referred to ἡ φθοῖς as well as ὁ φθόις may have helped in the formation of κοπίσκος: ἡ κοπίς. Sometimes such departures from the rule are only apparent, being due to our connecting with the wrong word as primitive. Thus οἰκίσκη belongs to ἡ οἰκία, not to ὁ οἶκος, σπληνίσκον to τὸ σπληνίον, not ὁ σπλήν, στεφανίσκη to ἡ στεφάνη, not ὁ στέφανος, ὀνίσκη to ἡ ὄνος, not ὁ ὄνος.

28. If words in -ισκο- were ever derived from adjectives (if not substantivized),[3] the gender of the derivative will of course depend altogether on congeneric words. κοιλίσκος 'a scoop-shaped surgeon's knife': κοῖλος 'hollow' followed some names of tools, e. g. μοχλίσκος, σφηνίσκος, or τορνίσκος. In view of the fact, however, that this is the only appellative which can plausibly be derived from a real adjective primitive, it may be safer to assume that it has come frome a substantivized form which has been lost.

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[1] Possibly the rare and late *ὁ λίνος* is the real primitive.

[2] The primitive may be the feminine *τρυπάνη*.

[3] So e. g. *ναστίσκος*: *ναστός* (sc. *πλακοῦς*) 'a cheese-cake' (§ 79).

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III. *-ΙΣΚΟ-* AS A SUFFIX OF SIMILARITY OR APPROXIMATE IDENTITY.

29. According to § 8 ff. the earliest use of -isko- was to form words in which it designated an approximation to a state or quality designated by a primitive adjective. After the suffix was used also to form derivatives from substantives it would of course designate an approximation to the nature of the primitive substantive, i. e. it would represent the derivative as like but not quite like the primitive, a use which though not found precisely in the same form in substantives of other languages than the Greek, yet bears a close resemblance to the prevailing meaning of the Germanic and Balto-Slavic adjectives with substantive primitives, e. g. Goth. barnisks 'child-like' : barn 'child,' funisks 'fiery' : funins (gen.) 'fire,' Lith. dañgiszkas 'heavenly' : dangùs 'heaven,' bérniszkas 'servantlike' : bérnas. Moreover, since this use, as well as the other uses of -isko-, was influenced by simple -ko-, we may compare Skt. substantives in -ka- which is exactly like Gr. -ισκο-, e. g. cūlaka-[1] 'top of a column' : cūla- 'crest,' chattrāka-m [1] 'mushroom' : chattra-m 'parasol.' For Gr. -ισκο- this remained the most characteristic use, one which is not only found in a larger number of words than any other, but often clings to words with deteriorative or diminutive meaning (cf. § 45 f., 56). I may mention as examples of this meaning : χηνίσκος : χήν, 'that which is like a goose' i. e. the end of a ship's stern turned up like a goose's neck, ἀστερίσκος : ἀστήρ, 'that which is like a star,' an ornament or knob of a helmet or flower, μηνίσκος : μήνη, something 'like a moon, but not a real one,' 'a crescent.'

30. This use of -ίσκο- must have existed at all periods of the language, but was most frequent in post-Classical times. There are, however, quite a number of certain examples from the Attic age. That none are found in the pre-Attic literature (epic and lyric poets) is explained partially by their dialect (§ 1), partially by their subject matter, since lyric poetry would be the very last place where one would expect words which, like most of those below, designated things belonging to the realm of technology. That not one of the ten words in -ισκο- of this earlier age show this use may therefore well be laid to the accident of transmission. Conversely, the greater number of post-Classical words of this type is partly due to the existence of technical writers from these periods, and authors like Hero, Galen, and Pollux are re-

[1] Cf. Edgerton, JAOS. 31. 114.

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sponsible for the preservation of quite a number. Yet after all there seems to have been a growth of this use of the suffix in the Alexandrian and Roman ages, a growth which apparently is commensurate with the decline of its 'diminutive' uses, and this explains its cause. In the Lyric age -ισκο- was *the* 'diminutive' suffix, and -ιον had not yet developed, while in the Alexandrian age -ιον was the 'diminutive' suffix par excellence, and left to -ισκο- its most characteristic function of designating similarity, which correspondingly increased. The Attic period represents a transition: 'diminutives' were still frequent, but the other function was gaining ground.

31. Of the two factors present in the notion of similarity, that of likeness in some respects and unlikeness in others,[1] the latter was undoubtedly the most important psychological factor for -ισκο- originally, if its origin was correctly described, since mere approximate identity was what the comparative degree emphasized. This emphasis is found e. g. in μηνίσκος 'crescent,' 'not a real i. e. full moon,' in contrast to μήνη 'moon,' βασιλίσκος : βασιλεύς, 'not a real king,' 'a mere kingling,' because king of a small country, παιδίσκη : παῖς, 'not a real child, but only approximately one,' because too old, 'a young girl,' χιτωνίσκος : χιτών, 'not a real tunic' because too short, 'a short coat.' The suffix, however, is not confined to these cases any more than -ιον; cf. e. g. οὐρανίσκος : οὐρανός, 'that which is like the sky,' 'the roof of the mouth,' or ὀνίσκος : ὄνος, 'that wich is like an ass,' 'a windlass,' in which a point of similarity in contrast to general dissimilarity is emphasized.

32. That -ίσκο- was actually interpreted as implying similarity rather than as a diminutive suffix is of course most evident when the derivative designates an object of the same or larger size than the primitive, e. g. σφηκίσκος : σφήξ, a large piece of wood shaped like a wasp's tail, χηνίσκος : χήν, the end of a ship's stern turned up like a goose's neck, παιδίσκη 'a young girl' : ἡ παῖς 'child,' 'little girl,' ἀγκωνίσκος 'joint' in a piece of wood one and one half ell wide : ἀγκών 'elbow.' Such words show what the interpretation originally was for οὐρανίσκος 'roof of mouth' : οὐρανός 'heaven,' ἱππίσκος a certain ornament for the head : ἵππος 'horse,' τροχίσκος 'a small ball of soap,' 'lozenge' : τροχός 'wheel,' ὀνίσκος 'a sea-fish of the cod kind' : ὄνος 'ass,' etc. Yet after the diminutive use had once been developed the notion of small size might appear uppermost in some words of this kind, and when the prim-

[1] Cf. Gr. Dims. 98 ff.

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itive may itself be used in a metaphorical or extended sense diminutives are altogether indistinguishable from these words. Thus is ἀξονίσκος, 'an axle' of certain machines, merely a 'little axle,' or 'that which is like an axle,' with the primitive conceived as designating only the axle of a wagon? Is μυΐσκη formed from μῦς 'sea-muscle' as a diminutive, or was the original meaning 'mouse' in mind, so that it was 'like a mouse?' Or is ἀσπιδίσκη, 'a little image of a shield' of gold or onyx, 'that which is like a shield' or 'a little shield,' the latter being possible because such an image might by an extension of the primitive itself be called ἀσπίς? In this way these words shade imperceptibly into the diminutives, though they scarcely are the ones that gave rise to the latter use.[1]

33. In a few words -ισκο- seems to shade into a possessive meaning, only apparently so, however, since there are no clear cases. ἀστερίσκος : ἀστήρ, 'an aster,' is that which is 'like a star,' not that which 'has a star,' and κεντρίσκος : κέντρον, a certain fish, is that which is 'like a prick,' not that which 'has a prick.' They are simply cases of naming complex phenomena by a striking feature, without necessarily selecting one which applies to the phenomenon as a whole.

34. Sometimes an extension of the use of the primitive without formal characterization causes it to become partially equivalent to a derivative in -ισκο- meaning 'like' the primitive. From this partial identity can come complete identity of meaning by semantic syncretism: καδίσκος 'voting-urn' became 'wine-jar' = κάδος, because the latter may itself be used of voting-urns just like the derivative, which was originally 'that which is like a wine-jar.' Such cases of equivalence easily cause other derivatives in -ισκο- to be made by analogy, without their ever having been different from their primitives.

The collection of examples will be subdivided according to congeneric groups.

1. Names of Persons.

35. *βασιλίσκος* : βασιλεύς, one who is 'like a king, but not a real one,' a king of a small country, therefore on border line of deteriorative use. Polyb. 3. 44. 5 εἰσήγαγε τοὺς βασιλίσκους τοὺς περὶ Μάγιλον. Certainly without contempt when used of the first person

[1] Cf. Gr. Dims. 10 ff.

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in CIG. 5072 Ἐγὼ Σιλκὼ βασιλίσκος[1] Νουβαδῶν καὶ ὅλων τῶν Αἰθιόπων.... ὅτε ἐγεγονέμην βασιλίσκ[ος]. *παιδίσκη*: ἡ παῖς, probably she who is 'approximately a child, but not quite' because too old,[2] originally 'a young girl,' 'maiden.' Cf. Phryn. 239 (Lobeck) παιδίσκη· τοῦτο ἐπὶ τῆς θεραπαίνης οἱ νῦν τιθέασιν· οἱ δὲ ἀρχαῖοι ἐπὶ τῆς νεάνιδος, οἷς ἀκολουθητέον. In this original meaning Ar. Ach. 1148 καθεύδειν Μετὰ παιδίσκης[3] ὡραιοτάτης. Xen. An. 4. 3. 11 κατίδοιεν . . . γέροντά τε καὶ γυναῖκα καὶ παιδίσκας. Even of a young wife Plut. Cic. 41. Usually specialized to 'servant' or 'prostitute.' The former probably is to be compared with the similar use of Engl. 'girl,' and is not a faded hypocorism, since ἡ παῖς in the meaning 'servant' as presupposed is late and rare. παιδίσκη as 'servant' e. g. Lys. frg. 51; Isae. 6. 19, 8. 35 ἔτι δὲ (sc. ἐκέκτητο) ἀνδράποδα μισθοφοροῦντα καὶ δύο θεραπαίνας καὶ παιδίσκην. Also Insc. Delph. CB. 2001. 4, 2071. 4. The meaning 'prostitute' e. g. Her. 1. 93; Din. 1. 23; Ath. 437 F πρὸς τὰς δημοσίας εἰσῄει παιδίσκας ἀδιαφόρως. This specialization may be due either to the influence of the deterioratives or hypocoristic words in the suffix. *παιδίσκος*[4]: ὁ παῖς, he who is 'approximately a child, but not quite,'[2] 'a youth,' 'lad' (cf. παιδίσκη). The passage which best shows its meaning is Xen. Hell. 5. 4. 32 ὅστις μέντοι παῖς τε ὢν καὶ παιδίσκος καὶ ἡβῶν πάντα τὰ καλὰ ποιῶν διετέλεσε, χαλεπὸν εἶναι τοιοῦτον ἄνδρα ἀποκτιννύναι. The position between παῖς and ἡβῶν in a series in which the emphasis is on remaining good all through life shows that an intermediate age is meant, so that παιδίσκος is virtually equivalent to μειράκιον or our 'lad.' Ar. Eccl. 1146 Καλεῖν γέροντα,

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[1] One can hardly make much of the passage. It is doubtful whether the the Nubian 'kingling' knew the emotional value of the Greek word he used.

[2] If *παιδίσκος* and *παιδίσκη* were formed with the notion 'too old or too large to be properly called child' they contain the roots of an amplificative meaning. This is, however, not at all certain; for comparison of the German 'das junge Mädchen' Engl. 'young girl' shows that there may have been a real diminutive idea, in as much as e. g. a girl may have been conceived of as being young not in comparison with other girls, but with the age of normal adult women.

[3] With a hypocoristic shade, cf. § 81.

[4] That *παιδίσκος* is so much rarer than *παιδίσκη* seems to be due to the fact that for a youth who had reached manhood it was customary to use *νεανίας* or *νεανίσκος*, while the feminine *παιδίσκη* did service for that age as well as the younger one of the *μεῖραξ*. Wackernagel at first (Glotta 2. 6 ff.) maintained that *παιδίσκος*, where found in Attic, was a Laconism, but later (Glotta 2. 315) retracted in view of its occurrence in Aristophanes.

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μειράκιον, παιδίσκον is rather puzzling, for it looks like a similar series in which παιδίσκος would be a younger boy than μειράκιον, yet even if so there is no need of assuming that it was synonymous with παῖς or even designated particularly small boys. In Herondas 3. 30 παιδίσκος seems to designate a rather young lad, and in Philox. 1. 2 ἁπαλὸς παιδίσκος ἐν ἀργυρέᾳ προχόῳ φέρων there is no hint as to his size.

For a number of proper names in which -ισκο- is a suffix of similarity see § 100 f.

2. Names of Animals.

36. Most of these form a closely associated group of words designating kinds of fish.

A. *Names of fish.* These are closely associated with other names of food-articles in which -ισκο- is hypocoristic in the sense 'delicious' (§ 62 f., 79), and such a force may here often have been united with the notion of similarity (e. g. the first example of γλαυκίσκος). The latter is the prime motive of formation when the primitive does not designate the same fish as the derivative. Examples: *βασιλίσκος*: βασιλεύς, a certain sea-fish which is 'king-like.' Opp. H. 1. 129. *γλαυκίσκος* probably a fish 'like the γλαῦκος, but not the same,' a different species.[1] Both are named from their color. Philem. frg. 4. 27 (l. 21); Arched. frg. 4. 436 (here with secondary diminutive meaning, see § 72); Baton frg. 4. 502 (l. 16); Damox. frg. 4. 530 (l. 18). *ἰωνίσκος*: Ἴωνες, a fish which is luxuriant 'like an Ionian.' Archestr. ap. Ath. 328 C Χρύσοφρυν ἐξ Ἐφέσου τὸν πίονα μὴ παράλειπε, Ὃν κεῖνοι καλέουσιν ἰωνίσκον. *καπρίσκος*: κάπρος, a fish 'like a boar,' because of a grunting noise. Ap. Athen. 355 F. *κεντρίσκος*: κέντρον, a fish 'like a sharp point,' i. e. a prickly one. Theophr. frg. 171. 9. *λευκίσκος*[2] probably a fish 'like the λεῦκος, but not the same,' 'the white mullet.' Hices. ap. Ath. 306 E. *λυχνίσκος*: λύχνος, a fish 'like a torch,' cf. Luc. V. H. 2. 30 καὶ ἰχθῦς δὲ εἶχε πολλούς, τοὺς μὲν δαλοῖς προσεοικότας, τοὺς δὲ μικροὺς ἄνθραξι πεπυρωμένοις, ἐκάλουν δὲ αὐτοὺς λυχνίσκους. *ὀνίσκος*: ὄνος, a fish 'like the ass' (cf. Lat. asellus), a sea-fish of the gadus or cod kind. Dorio ap. Ath. 118 C. Perhaps started from the use of the primitive itself to designate a fish. Cf. Ath. 315 F διαφέρει δ' ὄνος ὀνίσκου. *ὀρφίσκος* a fish 'like the ὀρφός, but

[1] If primitive and derivative are identical all examples are originally hypocoristic, belonging to § 79.

[2] Cf. *γλαυκίσκος*. Hardly directly from the adjective. Cf. Janson, op. cit. 65.

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not the same,' for it is given as a synonym of κίχλη by Pancrat. ap. Ath. 305 D. *τραγίσκος*: τράγος, a sea-fish 'like a goat.' Marcell. Sid. 23.

B. *Miscellaneous.* *βασιλίσκος*: βασιλεύς. a) a 'king-like' serpent, named thus because of a diadem-like spot on the head, as explained by Plin. 8. 21. 33. LXX Ps. 90. 13. b) a 'king-like' bird, the golden-crested wren (cf. the Germ. Zaunkönig), perhaps conceived as 'little king.' Aesop. ap. Plut. 2. 806 E ὁ Αἰσώπου βασιλίσκος ἐπὶ τῶν ὤμων τοῦ ἀετοῦ κομισθείς. *κρωμακίσκος* 'a young pig': κρῶμαξ 'a pile of stones,' because of its shapelesness (?) or for some obscure reason.[1] Antiph. frg. 3. 125 Κομψός γε μικρὸς κρωμακίσκος οὑτοσὶ Γαλαθηνός. *λυκίσκος*: λύκος, 'not a real wolf,' but only half a one, a half-breed between wolf and dog. Cf. Isid. Orig. 12. 2 lycisci dicuntur canes nati ex lupis et canibus, cum forte inter se miscentur. *μυΐσκος μυΐσκη*: μῦς, an animal 'like a mouse,' a kind of small sea-muscle. The latter perhaps a diminutive, cf. Diph. ap. Ath. 90 D αἱ δὲ μυΐσκαι τῶν μυῶν οὖσαι μικρότεραι. μυΐσκος is found Marcell. Sid. 38.

3. Parts of the Body.

37. *βωμίσκος*: βωμός, 'that which is like as altar,' a part of a tooth. Poll. 2. 93 τῶν μέντοι μυλῶν τὸ μὲν πρὸς τῇ σαρκὶ βωμίσκον καλοῦσιν. *Διονυσίσκος* 'that which is like Dionysus,' certain bony excrescences on the temple, "because the poets called Bacchus horned." Galen. 19. 443 (Kühn). *ἐχινίσκος*: ἐχῖνος, 'that which is like a pot,' a part of the ear. Poll. 2. 86 ἡ δὲ περὶ τῇ κυψέλῃ κοιλότης (sc. τοῦ ὠτὸς) ἐχινίσκος. *ὁλμίσκος* 'hollow of tooth': ὅλμος 'mortar.' Poll. 2. 93 τῶν μέντοι μυλῶν ... καλοῦσιν ... τὰς ... κοιλότητας ὁλμίσκους. *οὐρανίσκος* 'roof of mouth': οὐρανός 'heaven.' Arist. Probl. 33. 14. 963 a 2; Ath. 315 D.

4. Names of Plants.

38. *ἀστερίσκος*: ἀστήρ, a plant 'like a star,' an aster. Theophr. H. P. 4. 12. 2. *ἰβίσκος*: ἶβις, a plant 'like an ibis' (?).[2] Diosc. 3. 163. *Πριαμίσκος* 'cotton-tree': Πρίαμος, Gloss. *Πριαπίσκος* a plant 'like Πρίαπος' = ἐρυθρόνιον, of which Diosc. 3. 144 ἱστορεῖται

[1] Possibly the primitive was itself used of a young pig, and *κρωμακίσκος* would then be a diminutive.

[2] The fact that *ἐβίσκος* is the spelling in Galen and Suidas makes this etymology more than doubtful, and suggests an unknown foreign source. Cf. Janson, De Graeci Sermonis Dem. in *ισκος* 5.

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δὲ ὅτι καὶ εἰς τὴν χεῖρα ληφθεῖσα ἡ ῥίζα ἐρεθίζει πρὸς ἀφροδίσια. Doubtful is *ἀρακίσκος*: ἄρακος, a certain leguminous plant. Cf. Gal. 19. 85 (Kühn) ἀρακίδας· πυρίνους ἄρα ἀρακίσκους, εἶδος ὀσπρίου δέ ἐστιν ὁ ἄρακος. There is no clue whether primitive and derivative designate the same or different species; if the latter, ἀρακίσκος belongs here.

5. Statues and Dedicatory Images.

39. Since the primitive may itself be used of a statue or image without formal characterization, the derivative may be a diminutive if it designates a small statue, and no sharp line of distinction can be drawn. There is certainly no idea of small size in the first example of Πανίσκος.

A. *Images of gods.* *Ἀπολλωνίσκος* a statue of Ἀπόλλων. Ath. 636 F. *Πανίσκος* an image of Πάν. Clem. Al. 53 οἷαι δὲ καὶ ἄλλαι ὑμῶν εἰκόνες, Πανίσκοι τινὲς καὶ γυμναὶ κόραι καὶ σάτυροι μεθύοντες. For Cicero De nat. deor. 3. 17 see § 88. *Σατυρίσκος* an image of a satyr. Ath. 200 D Σατυρίσκος πεντάπηχυς.[1]

B. *Images of Animals.* *ἱππίσκος*: ἵππος, 'an image of a horse.' Insc. Sam. Hoffm. 3. 169. 41 (346/5 B. C.) ἱππίσκος χαλκοῦς. *πανθηρίσκος*: πάνθηρ, 'an image of a panther.' Hero Autom. 3. 3, 4. 1. *τραγίσκος*: τράγος, 'an image of a he-goat.' Insc. Del. Mich. 833. 24 (279 B. C.) τραγίσκοι χρυσοῖ ἄστατοι.

C. *Images of things.* *ἀσπιδίσκη*: ἀσπίς, 'an image of a shield.' CIA. 2. 751 Aa 8 ἀσπιδ[ί]σκας χρυσᾶς. Insc. Del. Mich. 833. 25, 34; Ditt². 588. 32 ἀσπιδίσκαι ὀνύχιναι ΔΔ. *κλινιηρίσκος*: κλινιήρ, 'an image of a couch.' Insc. Sam. Hoffm. 3. 169. 48. *πεδίσκη*: πέδη, 'an image of a chain.' Insc. Boeot. IGS. 2420. 27 χειριπέδας κὴ πεδίσκας [ἀρ]γουρίας, ὁλκὰ τρῖς δραχμή. *στεφανίσκος*: στέφανος, 'an image of a wreath or crown.' Insc. Del. Mich. 833. 51 στεφανίσκοι χρυσοῖ δύο, ὁλκὴ δράχμαὶ· Γ𐅄𐅄. στέφανος χρυσοῦς... ὁλκὴν δραχμαὶ· Η𐅅ΔΔΔΔ𐅄𐅄.[2] Insc. Cos Ditt². 734. 122.

6. Articles of Dress and Ornament.

40. *ἀσπιδίσκη*: ἀσπίς, a 'shield-shaped' ornament. Hes. ἀσπιδίσκαι·... περιφερὴς κόσμος ὅπλοις ἐοικώς. *ἀστερίσκος*: ἀστήρ, a 'star-shaped' ornament. Diod. 19. 34. *γραμματίσκον*: γάμμα, a 'gamma-shaped' ornament. Joan. Laur. De magist. reip. Rom. 2. 4 χιτῶσι

[1] Though the image was five ells long, it might yet have been a diminutive in contrast to the *δωδεκάπηχυς Διόνυσος* mentioned before.

[2] The contrast in weight between the *στέφανος* and the *στεφανίσκος* shows that diminutive interpretation is right for this passage.

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χρυσοῖς γαμματίσκοις ἀναλελογχωμένοις. *ἱππίσκος*: ἵππος, a 'horse-like' ornament for the head. Crat. Jun. frg. 3. 376 (2). *μηνίσκος*: μήνη, an ornament 'like the moon,' i. e. a crescent-shaped ornament for the neck. LXX Isai. 3. 18. Of a covering to protect the head of statues Ar. Av. 1114. *σεληνίσκος*: σελήνη, a 'moon-like' ornament, i. e. an ivory crescent on the boots of the Roman senators. Jo. Laur. Mens. p. 1. 19, De magistr. 2. 13. Of a crescent-shaped amulet in Hes. *τροχίσκος*: τροχός, an ear-ring, because 'like a wheel.' LXX Ezek. 16. 12. *χιτωνίσκος*: χιτών, 'not a real tunic, but only like one,' because shorter. Ar. Av. 946; Antiphan. frg. 3. 17 (3); Xen. An. 5. 4. 13; Dem. 19. 197; CIA. 2. 754. 12 (349/4 B. C).

7. Vases, Vessels, Baskets.

41. Of the considerable number of words of this group[1] the large majority is of obscure suffixal meaning, and often we can not tell whether primitive and derivative designated the same or different kinds of vessels, or whether the derivative was a diminutive. As to those cases where primitive and derivative are equivalent we can be sure that there is no fading of the notion 'belonging to the category of,' since there is no plausible example of such a meaning of -ισκο- being actually alive. We must rather assume that the few words in which the suffix designated similarity and which subsequently became equivalent to their primitives caused others to follow by analogy. Thus ἐχινίσκος 'a pot' was something 'like a sea-urchin's shell,' but the primitive ἐχῖνος could also be used of such a vessel, and with this meaning in mind primitive and derivative seemed equivalent, so that they could cause by analogy σταμνίσκος = στάμνος. In view of the uncertainty of the relation of primitive and derivative in so many words I divide the material into two groups: A) -ισκο- probably designates similarity; B) there is no evidence that primitive and derivative differed, though I would by no means affirm in every case that they *did* not differ.

A. *-ισκο- implies similarity.* *ἐχινίσκος*: ἐχῖνος (see above). Poll. 10. 95 mentions it with ἐχῖνος among τὰ τοῦ μαγείρου σκεύη. *θυλακίσκος*: θύλακος, that which is 'like a bag or sack,' a bread-net or basket. Crat. frg. 2. 237 (1. 6); Ar. frg. 2. 1046 (37), 1165 (6) Ἔπειτ' ἐπὶ τοὔψον ἦκε τὴν σπυρίδα λαβὼν Καὶ θυλακίσκον καὶ τὸ

[1] Cf. Gr. Dims. 91 ff. for a similar group of names of vessels in *-ιον*.

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μέγα βαλάντιον.[1] *καδίσκος* : κάδος (see § 34). Ar. Vesp. 321; Lys. 13. 37; Dem. 57. 13; CIA. 2. 678 B 27 (370–366 B. C.). *καρυΐσκος* : κάρυον, a 'nut-like' vessel. LXX Ex. 25. 33. *κοτυλίσκος* a cup 'like a κότυλος, but not the same,' because it has only one handle. Poll. 6. 96 τὸ δὲ μόνωτον κοτυλίσκος ὠνομάζετο. *κοτυλίσκος* designates a peculiar type of vessel, and thus contains the notion of similarity, also in Hes. κοτυλίσκος· κρατηρίσκος ᾧ χρῶνται οἱ μύσται . . . τινὲς τὰ μόνωτα ποτήρια. *ταλαρίσκος* : τάλαρος, a silver vessel shaped 'like a basket.' Theocr. 15. 113 Παρ' ὃ ἁπαλοὶ κᾆποι πεφυλαγμένοι ἐν ταλαρίσκοις Ἀργυρέοις. *χέλισκον* : *χέλειον*, probably a vessel shaped 'like a tortoise shell.' Hipp. ap. Erotian. p. 137 (Klein) χέλισκον· τρύβλιον.[2]

B. *-ισκο- has no appreciable meaning.* δροπίσκος 'basket' (Hes.) probably = *δροπίς,[3] the primitive being accidentally not quotable. *καδίσκος* = κάδος[4] 'wine jar.' Ar. frg. 2. 1176 (2); Cratin. frg. 2. 127; Strattis frg. 2. 771 (1). *καλαθίσκος* = κάλαθος 'a vase-shaped basket.' Ar. Lys. 535, 579, Thesm. 822; Eupol. frg. 2. 520 (35); *κρατηρίσκος* = (?) κρατήρ. Hes. s. v. κοτυλίσκος, see sub A. *κυλίσκη* = κύλιξ 'cup.' Poll. 6. 95, 10. 66. *λεκανίσκη* = λεκάνη 'dish, pot, pan.' Ar. ap. Poll. 6. 86; if Porson's conjecture is correct also Telecl. frg. 2. 362. *λεκίσκον* = τὸ λέκος 'dish, plate.' Hipp. ap. Poll. 10. 87. *λοπαδίσκος* probably = λοπάς 'plate,' though possibly a deteriorative. Schol. Ar. Vesp. 968. *λουτηρίσκος* = (?) λουτήρ 'bath-tub.' Gloss. *πιθίσκος* = πίθος 'jar.' Plut. Camill. 20, where Πιθίσκων is an uncertain conjecture for πίθων. *σταμνίσκος* = στάμνος 'wine-jar.' Poll. 7. 162. *ταλαρίσκος* = τάλαρος 'basket.' Arist. Probl. 20. 14. 924 b 11; Anth. P. 6. 174. *ὑδρίσκη* = ὑδρία 'water-pitcher.' Ath. 438 F καὶ κατὰ τῆς κεφαλῆς αὐτοῦ ὑδρίσκην ὑπὲρ δύο χοᾶς ἔχουσαν[5] παχέος μύρου καταχυθῆναι ἐκέλευσεν. LXX 4 Regg. 2. 20; Hes. ὑδρίσκη· ὑδρ[ε]ία. *φιαλίσκη* = (?) φιάλη 'a broad flat vessel.' Schol. Ar. Ran. 1360.

To the above can be added a word for 'basket' found in Hes.

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[1] Here *φυλακίσκος* can not be a diminutive because the context suggests a large quantity.

[2] The passage is suspected, and a lacuna has been assumed in order to get *χέλισκον* to be equivalent to *χελίσκιον* 'a little cough.'

[3] Though ultimately related to the verb *δρέπειν* it is better to assume a lost primitive than that *δροπίσκος* is in reality a verbal formation, as does Janson op. cit. 4. No verb form with o grade seems to be in existence.

[4] This equivalence is due to semantic syncretism, cf. § 34.

[5] In this example possibly 'like a water-pitcher' because put to a different use.

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in a variety of forms: ὁρισ[σ]ός· φορμός. συρίσκος· ἀγγεῖόν τι πλεκτόν, εἰς ὃ σῦκα ἐμβάλλουσι. τινὲς δὲ ὁρίσκον. ἀρίσκος· κόφινος. Whatever the origin of this undoubtedly foreign word,[1] the forms in -ισκο- were due to the attraction of other words in the same suffix designating baskets.

8. Architectural and Technological Words.[2]

42. *ἀβακίσκος* : *ἄβαξ*, that which is 'like a slab or board,' a (small) stone for inlaying in mosaic work. Moschio ap. Ath. 207 C. *ἀγκωνίσκος* : ἀγκών, that which is 'like an elbow,' something having an angle, e. g. tenons or door-hinges. Hero Spir. 228 f.; LXX Ex. 26. 17; Suid. Ἀγκωνίσκος· σκεύη τιμωρητικά. *ἀξονίσκος* : ἄξων, that which is 'like an axle, but not a real one,' if the primitive is thought of as designating an axle of a wagon, its most frequent use. If not, ἀξονίσκος is a diminutive. Hero Spir. 220; Hes. λυκίσκος· ἡ μὴ ἔχουσα ἀξονίσκον[3] τροχαλία, τρῆμα δὲ μόνον. *ἀσπιδίσκος* : ἀσπίς, a boss, because 'like a shield.' Schol. E 743 φάλοι οἱ κατὰ τὸ μέτωπον τῆς περικεφαλαίας ἀσπιδίσκοι. Hes. ἀσπιδίσκοι· τῆς κιθάρας ἐπ' ἄκροις πήχεσιν. *ἀστερίσκος* : ἀστήρ, the boss or knob of a helmet, because 'like a star.' Eustath. 424. 5. *ἀστραγαλίσκος* : ἀστράγαλος, that which is 'like the vertebrae or a die.' a) a part of a wine-cooler. Poll. 6. 99 οὐ μὴν ἔχει (sc. ὁ ψυκτήρ) πυθμένα ἀλλ' ἀστραγαλίσκους. b) bosses or discs of metal on the helmet. Hes. φάλαρα· ἀστραγαλίσκος ὁ ἐπὶ τῆς περικεφαλαίας. *βατραχίσκος*· μέρος τι τῆς κιθάρας Hes.: βάτραχος 'frog.' *βωμίσκος* : βωμός, that which is 'like an altar, but not a real one,' a model of an altar, though perhaps a diminutive. Hero Spir. 191. *γραφίσκος* : γραφεῖον, a surgical instrument 'like a pencil.' Hes. *διφρίσκος* : δίφρος, something 'like a war-chariot,' but not the same, a racing-chariot. Since the latter is lighter than the war-chariot, it might be considered as a diminutive. Ar. Nub. 31 Τρεῖς μναῖ (sc. χρέος ἔβα με) διφρίσκου καὶ τροχοῖν Ἀμυνίᾳ. *ζυγίσκον* : ζυγόν, that which is 'like a yoke,' explained by the editor's note to an Eleusinian inscription in Ἀρχ. Εφ. 1899 p. 188 n. 9, 10: vincula metalli firmitatis aut ornamenti causa cingentia cistas ligneas. *καλαμίσκος* : κάλαμος, that which is 'like a reed.' a) an instrument for dressing the hair. Theod. Prodr. p. 437. b) a branch of a

[1] Janson, op. cit. 5, would make these words Aeolic, but if nothing else the fact quotes § 1 would make this impossible.

[2] Not repeating, of course, those of 6 and 7.

[3] Codd. *ἐξονίσκον*.

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candle-stick. LXX Ex. 25. 31 ff. *καυλίσκος* : καυλός, that which is 'like the stalk of a plant.' a) a branch of a candle-stick. Joseph. B. J. 7. 5. 5. b) a silver tube. Diod. Excerpt. 521. 10. *κρουνίσκος* : κρουνός, that which is 'like a spring,' the cock or top e. g. of the clepsydra. Schol. Luc. Pisc. 28; Hero Spir. 178. *κυαθίσκος* : κύαθος, that which is 'like a cup or hollow,' mentioned among surgical instruments in Cod. Laur. 74. 2, see Herm. 38. 282. It designates the hollow side of a probe in Galen. 19. 122 μήλης τῷ πλάτει· τῷ κυαθίσκῳ τῆς ὀφθαλμικῆς μήλης. *κυκλίσκος* : κύκλος, that which is 'like a circle or wheel.' a) a ring to pass the reins through. Galen. 3. 321. b) a circular astronomical instrument. Ptol. Almag. Halm. t. 1 p. 46. 21 ff. *λυκίσκος* : λύκος 'wolf'; reason for name obscure. Hes. s. v., see ἀξονίσκος. *μηνίσκος* : μήνη, that which is 'like the moon' i. e. crescent-shaped. a) a part of the rudder according to Hes. τὰ χαλκώματα τῶν πηδαλίων. b) metal crescents. CIA. 2. 678 B 48 (378–366 B. C.) μηνίσκοι χαλκοῖ III. *μοχλίσκος* : μόχλος, an instrument 'like a lever,' a certain surgical instrument. Hipp. Art. 830. Seems to be equivalent to its primitive in Ar. ap. Poll. 10. 147, probably because of semantic syncretism. *ναΐσκος* : ναός, that which is 'like a temple, but not a real one,' a shrine or a chapel. Strabo 637; Joseph. H. J. 8. 8. 4; Hero Spir. 191. *ὀβελίσκος* : ὀβελός is puzzling because in their most frequent use the two words coincide from the beginning : ὀβελίσκος is merely 'a spit,' with no clear reference to small size, in Ar. Ach. 1007 (Φέρε τοὺς ὀβελίσκους, ἵνα ἀναπειρῶ τὰς κίχλας), Vesp. 354, 364, Av. 359, 388, 672; Sotad. frg. 3. 585 (1. 10); Anaxipp. frg. 4. 465 (1); Xen. Hell. 3. 3. 7; Arist. Mirab. 63. 835 a 18, Pol. 7. 2. 1324 b 19. Probably this identity is due to prehistoric syncretism (cf. § 34). In the following uses ὀβελίσκος was conceived as 'like a spit': a) the leg of a compass. Ar. Nub. 178. b) a sword-blade. Polyb. 6. 23. 7. c) iron head of a Roman pilum. Dion. H. 5. 46. d) an iron or copper coin stamped with a spit. Plut. Lys. 17, Fab. 27. e) an obelisk. CIG. 1838 b 14, from Corcyra. *οἰκίσκος* : οἶκος, that which is 'like a house.' a) a bird-cage. Ar. frg. 2. 1119 (8, 9), 1129 (10). b) peel or shell of seeds or nuts. Arist. De Plant. 1. 5. 820 b 10. c) a little model of a house or cage in Insc. Del. Ditt². 588. 31 (ab. 180 B. C.) ζωιδάρια ἀργυρᾶ ‖ ἐν οἰκίσκωι ξυλίνωι. *ὅλμίσκος* 'socket or hinge of door': ὅλμος 'mortar'. Sext. Emp. M. 10. 54. *ὀνίσκος* : ὄνος, that which is 'like an ass.' a) a windlass or crane. Hipp. Fract. 761, its handle id. Art. 834. b) a saw. Hes. ὀνίσκος· τεκτονικὸς πρίων. *οὐρανίσκος* : οὐρανός, that which

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is ' like the sky,' the vaulted ceiling of a room or top of a canopy.[1] Phylarch. ap. Ath. 539 E ; Plut. Alex. 37, Phoc. 33. *παραβολίσκος* : παράβολον, perhaps something ' edge-like,' a projection. CIA. 2. 678 B 79 παραβολίσκοι τῆς τετρα[κ]ύκλου ΔIII. *Πριαπίσκος* : Πρίαπος, a part of a surgical instrument. Oribas. 128 Mai. *πυργίσκος* : πύργος, that which is ' like a tower.' a) a burial-vault. Insc. Lyc. CIG. 4207. 13, 4212. b) a casket. Artemid. 1. 74. c) probably a tower-like part of a ship in Sext. Emp. M. 9. 78, 7. 102 (L. & Sc. have ' casket).' *ῥοΐσκος* : ῥόα, a knob or tassel shaped ' like a pomegranate.' LXX Ex. 28. 29 ; Joseph. A. J. 3. 7. 4 ; Suid. *στυλίσκος*[2] : στῦλος, that which is ' like a pillar.' a) a staff or rod. Hipp. Mochl. 865 ; Strabo 164 ὅσον ποδιαῖον τὸ ὕψος ἐπιθεμένας στυλίσκον. Insc. Del. Mich. 833. 101 (279 B. C.). b) a part of a surgical instrument. Oribas. 128 Mai. c) a mast to carry a sail at the stern. Eustath. 1039. 38. *σφηκίσκος* : σφήξ, that which is ' like a wasp or its tail.' a) a pointed stick or stake. Ar. Plut. 301 Μέγαν λαβόντες ἡμμένον σφηκίσκον. b) roof-timbers or rafters. Polyb. 5. 89. 6 ξύλ᾽ ἀφ᾽ ἑκκαιδεκαπήχους ἕως ὀκταπήχους εἰς σφηκίσκων λόγον μύρια. Insc. Att. Ditt[2]. 537. 71 (346 B. C.) ; CIA. 2. 835 c-l 12 (320—317 B. C.). c) a projecting stone over the entrance door (?). Arist. frg. 420. 1548 a 16. *σωληνίσκος* : σωλήν, that which is ' like a channel or pipe,' explained by Schol. Σ 401 σωληνίσκους· λέγει δὲ τὰς λεγομένας σύριγγας, αἱ περιλαμβάνουσι τοὺς πλοκάμους ἢ εἰς ἃς κατακλείονται αἱ περόναι. *τροχίσκος* : τροχός, that which is ' like a wheel or hoop,' a metal ball let fall to mark time. Jo. Laur. De Mag. 2. 16. *χηνίσκος* : χήν, that which is ' like a goose.' a) the end of a ship's stern, because turned up like a goose's neck. Luc. V. H. 2. 41, Nav. 5 ; Suid. s. v. b) a handle of a mixing-bowl shaped like a goose's neck. Insc. Del. Ditt.[2] 588. 156, 159.

9. Miscellaneous.

43. *ἀρτίσκος* : ἄρτος something ' like a loaf ' of bread, a pill. Diosc. 2. 203. *ἀστερίσκος* : ἀστήρ, a mark ' like a star,' an asterisk (·⁘·). Eustath. 599. 34 ; as a metrical sign Hephaest. p. 137. *βωμίσκος* : βωμός, something shaped ' like an altar,' a mathematical solid of three unequal dimensions. Hero Def. 114 Σφηνίσκος δέ ἐστι τὸ

[1] It must have been by an extension of this meaning that *οὐρανίσκος* is used of the Corona Australis, a constellation of the southern hemisphere, in Schol. Arat. 397. The ' crown ' evidently seemed like a canopy.

[2] Possibly a diminutive in the meanings a and b.

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ἔχον ἄνισα ἀλλήλοις τό τε μῆκος καὶ τὸ πλάτος καὶ τὸ βάθος, τινὲς δὲ καὶ βωμίσκον καλοῦσιν τὸ τοιοῦτον σχῆμα. *καλαθίσκος* 'a certain kind of dance': κάλαθος 'basket.' The point of similarity is obscure. Perhaps, however, the name is merely a metonymy of καλαθίσκος = κάλαθος, in as much as baskets might have been used in the dance, whence the name. Apollophan. ap. Ath. 467 F; Men. ap. Hes. s. v. *κοπίσκος* 'a pastille' of frankincense from the yew tree: κοπίς 'chopper, cleaver, sting of scorpion, etc.,' because of its cone-like shape? Diosc. 1. 82. *κοτυλίσκος*: κότυλος, that which is 'like a cup.' a) a kind of cake. Ath. 647 B; Hes. b) a pit used for sacrificing to the earth. Hes. κοτυλίσκος·... βόθρος εἰς ὃν τὸ αἷμα τῶν τῇ γῇ θυομένων ἐνέβαλλον. *κυκλίσκος*: κύκλος, anything 'circular.' a) a small round cake. Galen. 12. 276; Diosc. 2. 105 (of wax). b) a round spot. Clyt. ap. Ath. 655 D. *μηνίσκη*: μήνη 'moon.' Hes. μηνίσκην· ὁμένα. πέταλα. *μηνίσκος*: μήνη, 'not a full moon, but only like it,' the half moon, a crescent. Carnut. N. D. 34. 231 πεπλήρωται μὲν αὐτῇ (sc. τῇ σελήνῃ) ὁ μηνίσκος, οὐ πεπλήρωται δ' ὁ κύκλος. Otherwise of something 'like a half-moon,' i. e. crescent-shaped. a) a crescent-shaped figure. Arist. Sophist. Elench. 11. 171 b 15, 172 a 3. b) crescent-shaped spots of light. Arist. Probl. 15. 11. 912 b 14. c) a crescent-shaped line of battle. Polyb. 3. 115. 5. *πηχίσκος*: πῆχυς, an 'arm-like' piece of wood as to length, defined by Suidas as ξυλάριον πηχυαῖον. *σφηνίσκος*: σφήν, that which is 'wedge-shaped.' a) a wedge-shaped bandage. Paul Aeg. 6. 4. b) a mathematical solid of three unequal dimensions. Nicom. Ar. 2. 6; Hero Def. 114, see βωμίσκος. *τροχίσκος*: τροχός, that which is 'like a wheel or circle,' a ball of soap, pastille, lozenge. Arist. Mirab. 19. 831 b 27; Theophr. H. P. 9. 9. 1, 3; Diosc. 2. 105. *φθοΐσκος*: φθόις, that which is 'like a cake.' a) a pill. Hipp. 621. 2, 673. 9. b) = its primitive in the meaning 'cake.'[1] Erotian. p. 134 Klein.

IV. *-ΙΣΚΟ-* AS A DETERIORATIVE SUFFIX.

44. The deteriorative use of Greek -ισκο- is paralleled by the Slavic use of the suffix in neuters like Pol. drzewsko 'wretched tree,' or in Germanic adjectives like Germ. kindisch Engl. childish, but the differences between these languages force the conclusion upon us that all three groups developed this meaning independently (§ 11). Gr. -ισκο- must either have developed its deteriorative

[1] Either by syncretism or originally hypocoristic (§ 79).

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use within itself or more probably by semantic syncretism with I. E. -ko-, which has this function e. g. in Skt. usriká-s 'miserable bullock,' rājaká-s 'worthless kingling,' or in Lith. kuinókas 'nag,' Slov. kraváča 'wretched cow,' traváča 'poor grass,' extended by -lo- in Lat., e. g. sermunculus 'wretched talk, babbling.'

45. Though the fact that the three genders of -ισκο- are a quality which it has in common with I. E. -ko- makes it seem probable to me that syncretism of the two suffixes caused the deteriorative use of the Greek, yet there are a number of words which are on the border line between this meaning and its use to designate similarity. This, however, does not necessarily argue an independent development from the latter, but these transition types themselves may have been transmitted from -ko- by the same assimilation of meanings, and they would consequently be rather an indication of how the simple suffix became deteriorative.[1]

46. These transition types were words in which -ισκο- was added with the idea of mere similarity as opposed to complete identity, and with the consequent notion that the primitive would really be inapplicable, but the point of comparison involved or implied was itself some point of inferiority of the derivative to the primitive. Thus *αἰγίσκος*: αἴξ was an animal 'like a goat, but not a real one,' because castrated. Cf. Hes. αἰγίσκον· αἶγα ἐκτομίαν, where there was no doubt as to the judgment of inferiority involved. In the same way *βασιλίσκος* (§ 35) : βασιλεύς as 'king of a small country,' therefore 'not a real king,' i. e. not worth the name, was on the border line of the deteriorative use. Similarly βασιλίσκος is used of one who was too homely to deserve the name 'king' in Ath. 566 A γυναικὸς αὐτῷ καλῆς φαινομένης, ἑτέρας δὲ αἰσχρᾶς καὶ πλουσίας, ὡς ἀπέκλινεν ἐπὶ τὴν πλουσίαν, ζημιῶσαι τοὺς ἐφόρους αὐτόν, ἐπιλέγοντας ὅτι βασιλίσκους ἀντι βασιλέων τᾷ Σπάρτᾳ γεννᾶν προαιρεῖται. Also *δραπετίσκος* (Luc. Fugit. 38) : δραπέτης, 'one who is like a fugitive, but not a real one,' because unsuccessful, therefore 'a poor excuse for a fugitive.' Perhaps also *τραγίσκος* : τράγος, applied to a lame goat in Hes. (ἐξάγω χωλὸν τραγίσκον· παιδιᾶς εἶδος παρὰ Ταραντίνοις), belongs here,[2] in as much as its lameness caused the conception 'not a complete goat, but only like one.' In all these cases it is to be noticed that the deteri-

[1] The fact that all of the apparent pattern types were post-Classical makes it improbable that they were the real patterns.

[2] On the other hand it may be hypocoristic, cf. § 83.

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orative meaning has been brought in without the interposition of any diminutive element.

47. Sometimes, however, the deteriorative idea may be derived from that of small size, so certainly in the use of ἀνθρωπίσκος 'wretched little manikin' in Eur. Cycl. 316 (§ 53), where the Cyclops thus addresses Odysseus in contrast to his own size and power, but with a contempt which is the result of the appreciation of this difference. At other times the contempt is derived from the hypocoristic use of the suffix, e. g. when a hypocorism is applied ironically. So *μειρακίσκη* 'dear little maid' is addressed in derision to an old woman in Ar. Plut. 963. Similarly *σκιαδίσκη*: σκιάς in Anacr. 21. 13 σκιαδίσκην ἐλεφαντίνην φορεῖ Γυναιξὶν αὔτως. The umbrella is viewed with contempt because of its being for men a reprehensible luxury, an originally hypocoristic idea. Cf. Gr. Dims. § 152.

48. The fully developed deteriorative notion, no matter of what origin, does not really always consist of contempt, but the emotion may be hate or anger.[1] Rarely so in Greek. In -ισκο- I find *καδίσκος*: κάδος 'wine-jar' in Crat. frg. 2. 122 (8) συντρίψω γὰρ αὐτοῦ τοὺς χόας Καὶ τοὺς καδίσκους συγχεραυνώσω σποδῶν Καὶ τἄλλα πάντ' ἀγγεῖα τὰ περὶ τὸν πότον, Κοὐδ' ὀξύβαφον οἰνηρὸν ἔτι κεκτήσεται. Similarly *νεανίσκος* § 53 (2d ex.).

49. The deteriorative use of -ισκο- never seems to have had great productivity. I can quote only twenty one words of all periods, mostly from Classical writers, for -ιον later encroached (§ 30). Its beginning, however, antedates the transmission, since σκιαδίσκη occurs in the Lyric poet Anacreon and other examples come from Old Comedy.

1. The Deteriorative represents an Object as being Despicable in Comparison with the Normal of its Class.

50. The deteriorative meaning which develops directly from the notion of similarity as shown § 46, which is probably at the root of most of the deteriorations, since it is due to the shorter cut from the older meaning, must originally represent an object as being despicable in comparison with the normal of its class. Thus δραπετίσκος 'a poor excuse for a fugitive,' 'an unsuccessful fugitive,' because 'not a real fugitive, but only like one,' falls below the normal of the class fugitive because of its quality of

[1] Such words are called imprecatory diminutives by Edgerton, JAOS. 31. 138 f.

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want of success. As time went on and the deteriorative element completely displaced the notion of similarity, we find e. g. ἀνθρωπίσκος 'contemptible fellow' without the notion that ἄνθρωπος would really be inapplicable.

51. *Collection of Examples.* *ἀνθρωπίσκος*: ἄνθρωπος, 'a contemptible or insignificant man.' Ar. Pax 751 Οὐκ ἰδιώτας ἀνθρωπίσκους κωμῳδῶν οὐδὲ γυναῖκας, Ἀλλ' Ἡρακλέους ὀργήν τιν' ἔχων τοῖσι μεγίστοις ἐπεχείρει. Plato Resp. 6. 495 C ἄλλοι ἀνθρωπίσκοι . . . ἐκ τῶν τεχνῶν ἐκπηδῶσιν εἰς τὴν φιλοσοφίαν. id. Phaedr. 243 A σεμνύνεσθαι ὡς τι ὄντε, εἰ ἄρα ἀνθρωπίσκους τινὰς ἐξαπατήσαντε εὐδοκιμήσετον ἐν αὐτοῖς. *βουκολίσκος*: βουκόλος, title of Theocr. 20, referring to a vain-glorious herdsman. *καδίσκος*: κάδος, 'hateful wine-jar,' see § 48. *μαγειρίσκος*: μάγειρος 'cook.' Ath. 292 E ἄλλος σοφιστὴς μαγειρίσκος. *μειρακίσκος*: μειράκιον [1] 'youth.' Alex. frg. 3. 467 (1. 8) Χειμὼν ὁ μειρακίσκος ἐστὶ τοῖς φίλοις. *νεανίσκος*: νεανίας 'young man.' Ar. Av. 1362 (ironically hypocoristic) Σοὶ δ' ὦ νεανίσκ', οὐ κακῶς ὑποθήσομαι. . . . σὺ γὰρ Τὸν μὲν πατέρα μὴ τύπτε. Xen. An. 2. 1. 13 (ironical) ἀλλὰ φιλοσόφῳ μὲν ἔοικας, ὦ νεανίσκε, καὶ λέγεις οὐκ ἀχάριτα. id. Apol. 31 ὁ νεανίσκος ἡσθεὶς οἴνῳ οὔτε νυκτὸς οὔτε ἡμέρας ἐπαύετο πίνων. id. Cyr. 5. 2. 27 οὐ σὺ τοῦ νεανίσκου τούτου . . . ὑπερηφανίαν πολλήν τινα τοῦ τρόπου κατηγόρεις; Aeschin. 1. 171 νεανίσκος δὲ ὀρφανὸς ἡμμανὴς διεχείριζε τὴν οὐσίαν. *πινακίσκος*: πίναξ, 'filthy trencher or plate.' Ar. Plut. 813 τοὺς δὲ πινακίσκους τοὺς σαπροὺς Τοὺς ἰχθυηροὺς ἀργυροῦς πάρεσθ' ὁρᾶν. id. frg. 2. 1160 (7) Πινακίσκον ἄπυρον ἰχθυηρόν. *ῥητορίσκος*: ῥήτωρ 'orator,' an ironical address in Gell. 17. 20. 4 'heus,' inquit, 'tu, rhetorisce.' *σανδαλίσκον*: σάνδαλον, 'worthless sandal,' because torn. Ar. Ran. 405 Σὺ γὰρ κατεσχίσω μὲν ἐπὶ γέλωτι Κἀπ' εὐτελείᾳ τόδε τὸ σανδαλίσκιον Καὶ τὸ ῥάκος. *σινδονίσκη* 'cheap or worthless σίνδων.' Plut. 2. 340 D ἐν εὐτελεῖ σινδονίσκῃ.

2. The Deteriorative represents an Object as belonging to a Despicable Class, or Refers to the Class itself.

52. This was possible just as soon as the original notion 'like but not quite the same' had completely given way to the notion of contempt.[2] When e. g. was formed ἀνθρωπίσκος 'contemptible

[1] If *μειρακίσκος* goes back to pre-literary times, when *μεῖραξ* may have designated boys as well as girls, the latter might have been the primitive. Cf. Gr. Dims. 110.

[2] For those deterioratives which developed from diminutive or hypocoristic meaning (§ 47) this was possible from the beginning.

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man' without the idea that ἄνθρωπος was inapplicable, the same word could as well be applied in a situation in which all mankind appeared contemptible in contrast to superior beings. Similarly ἀμφορίσκος in § 53 is a deteriorative to ἀμφορεύς 'jar' because any jars are contemptible in comparison with great public works and ornaments.

53. *Collection of Examples.* *ἀμφορίσκος* (§ 52). Dem. 22. 76 κτήματ' ἀθάνατ' αὐτῷ περίεστιν, τὰ μὲν τῶν ἔργων ἡ μνήμη, τὰ δὲ τῶν ἀναθημάτων τῶν ἐπ' ἐκείνοις σταθέντων τὸ κάλλος, προπύλαια ταῦθ' ὁ παρθενὼν στοαὶ νεώσοικοι, οὐκ ἀμφορίσκοι δύ' οὐδὲ χρυσίδες τέτταρες ἢ τρεῖς, ἄγουσ' ἑκάστη μνᾶν, ἅς, ὅταν σοι δοκῇ, σὺ πάλιν γράψεις καταχωνεύειν. *ἀνθρωπίσκος*: ἄνθρωπος 'man.' Combined with or secondary to the diminutive meaning in Eur. Cycl. 316, where the Cyclops addresses Odysseus Ὁ πλοῦτος, ἀνθρωπίσκε, τοῖς σοφοῖς θεός. It is to be noticed, however, that the chief point of comparison seems to be wisdom rather than size. *γραμματίσκος*: γραμματεύς 'secretary,' a much despised class. Herodian 2. 859. 22, without context. *κλεπτίσκος*: κλέπτης 'thief.' Eupol. ap. Poll. 8. 34 τὸν δὲ κλέπτην εἴποις ἂν καὶ κλεπτίσκον[1] ὡς Εὔπολις. *κυνίσκος*: κύων 'Cynic.' Luc. Pisc. 45. *μειρακίσκος*: μειράκιον 'lad, youth.' Plato Resp. 7. 539 B οἱ μειρακίσκοι, ὅταν τὸ πρῶτον λόγων γεύωνται, ὡς παιδιᾷ αὐτοῖς καταχρῶνται, ... χαίροντες ὥσπερ σκυλάκια τῷ ἕλκειν τε καὶ σπαράττειν τῷ λόγῳ τοὺς πλησίον ἀεί. *νεανίσκος*: νεανίας 'youth.' Ar. Ach. 680 Οἵτινες γέροντας ἄνδρας ἐμβαλόντες ἐς γραφὰς Ὑπὸ νεανίσκων ἐᾶτε καταγελᾶσθαι ῥητόρων. id. Equ. 731 διὰ σὲ τύπτομαι Ὑπὸ τουτουὶ καὶ τῶν νεανίσκων ('hateful youths'). id. Nub. 1053 ταῦτ' ἐστὶ ταῦτ' ἐκεῖνα, Ἃ τῶν νεανίσκων ἀεὶ δι' ἡμέρας λαλούντων Ἱλῆρες τὸ βαλανεῖον ποιεῖ, κενὰς δὲ τὰς παλαίστρας. *οἰκίσκος*: οἶκος 'chamber or room.' Dem. 18. 97 πέρας μὲν γὰρ ἅπασιν ἀνθρώποις ἐστὶ τοῦ βίου θάνατος, κἂν ἐν οἰκίσκῳ τις αὐτὸν καθείρξας τηρῇ. *πινακίσκος*: πίναξ 'trencher.' Plato Com. frg. 2. 656 (1) Κατέλαβον Ἐπικράτης τε καὶ Φορμίσιος Παρὰ τοῦ βασιλέως πλεῖστα δωροδοκήματα, Ὀξύβαφα χρυσᾶ καὶ πινακίσκους ἀργυροῦς. *σκιαδίσκη*: σκιάς[2] 'umbrella.' See § 47.

3. Secondary Deterioratives.

54. If a word whose -ισκο- was added with a sense different from the deteriorative or one which did not differ from its primi-

[1] So Cod. Falckenb., others *κλεπτίστατον*.

[2] I have assumed that the meaning 'umbrella' is accidentally not quotable for *σκιάς* rather than that *σκιάδειον* is the primitive.

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tive at all got placed in a situation which implied contempt for the thing designated, particularly if some deteriorative adjective like φαῦλος or some other deteriorative in -ισκο- was in the neighborhood, it could be reinterpreted as a deteriorative,[1] at least for the time being. Thus γλαυκίσκος seems to be the ordinary designation for a certain fish, having been formed with the notion of similarity (§ 36 A), but may have been felt as a deteriorative in Philem. frg. 4. 27 (l. 21) Εἰ δ' ἔλαβον ἀρτίως σκάρον ἢ 'κ τῆς Ἀττικῆς Γλαυκίσκον, ὦ Ζεῦ σῶτερ, ἢ ἔξ Ἄργους κάπρον, ... Ἅπαντες οἱ φαγόντες ἐγένοντ' ἂν θεοί. Perhaps *παιδίσκη* in the meaning 'prostitute' (§ 35) was another word in which the deteriorative meaning came in secondarily. *Πανίσκος* 'an image of Πάν' is placed in a contemptible situation in Clem. Al. 53 (§ 39 A). *χιτωνίσκος*: χιτών (§ 40) may have been felt as a deteriorative Apollod. frg. 4. 453 Σχιστὸν χιτωνίσκον τιν' ἐνδέδυκας and Aeschin. 1. 131 εἰ γάρ τίς σου τὰ κομψὰ ταῦτα χλανίσκια περιελόμενος καὶ τοὺς μαλακοὺς χιτωνίσκους ... δοίη εἰς τὰς χεῖρας τῶν δικαστῶν, οἶμαι ἂν αὐτοὺς ... ἀπορῆσαι εἴτε ἀνδρὸς εἴτε γυναικὸς εἰλήφασιν ἐσθῆτα.

V. *-ΙΣΚΟ-* AS A DIMINUTIVE SUFFIX.

55. The diminutive use of Gr. -ισκο- has a parallel only in some Slavic dialects, e. g. Slov. jarišče 'a lamb a year old,' or repišče 'little turnip.' According to Belič, Arch. f. sl. Phil. 23. 179, however, this use is developed from the deteriorative within the Slavic itself, and consequently has no direct connection with Gr. -ισκο-. The latter must therefore have developed independently from the use of the suffix to designate similarity, or arose by semantic syncretism with I. E. -ko-, which forms occasional diminutives in several groups, e. g. in Skt. putraká-s 'little son,' kundikā 'little pot,' or in O. Blg. synъkъ 'little son,' kamenьcь 'little stone,' often in conglutinates like Latin -culo- in homunculus 'manikin,' Germanic -linga- in O. Icel. gaeslingr Engl. gosling, or Lith. -uka-s in parszùkas 'little pig.'

56. If diminutive -ισκο- developed by syncretism with -ko-, the transition types were inherited by the conglutinate along with the other types of usages,[2] and we therefore still find traces of the way in which the notion of small size developed from similarity, no matter when. As with -ιον the transition took place in words

[1] Cf. Gr. Dims. 127 ff.

[2] Cf. § 45 f.

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which designate an object as being 'like but not the same as the primitive' because the latter included in its meaning the idea of a certain size, and to anything that fell below this normal it could not properly be applied. Thus αὐλός, like our 'flute,' was used only of the larger kinds of wind instruments of that type, while a smaller one of the same kind was αὐλίσκος 'not a real flute but merely like it,' with which we may compare our use of 'piccolo,' an entirely different stem. Similarly ναΐσκος 'a shrine' was 'something like a temple, but not a real one,' but might be thought of as 'little temple.' κεστρινίσκος was evidently 'not a real κεστρῖνος (a kind of fish),' because it was the smaller species (§ 62 Aa). πτερίσκον, applied to feathers of a very young bird, may have been thought of as 'not a real feather yet,' since they are soft and down-like. In all such cases a shift of attitude as to what was the proper application of the primitive, particularly in the transmission from speaker to hearer, caused the diminutive interpretation to become complete. If to a hearer αὐλός should designate such an instrument of any size, he could not interpret αὐλίσκος otherwise than 'a little flute.' Perhaps also certain words designating the young of animals [1] could have been felt the same way, e. g. δελφινίσκος 'a little or young dolphin' was 'not a real dolphin yet,' because too small to be called by that name if we think of it as applying to an animal of normal size. Cf. also οἰνίσκος 'young wine,' 'scarcely wine as yet,' because not sufficiently fermented. In these two words the diminutive idea was rather 'young' than 'small,' in οἰνίσκος exclusively so.

57. As long as there was any trace of the original notion of similarity a diminutive could refer to an object only as being smaller than the normal of its class, since the notion that the primitive was really not applicable involved the isolation of the derivative, as it were, from the great mass of objects to which the primitive could refer, e. g. πτερίσκον, applied to the first downy feathers of a young bird, by the notion 'too small to be really called a feather' implied that the normal feather was larger than the one designated by πτερίσκον. Just as soon, however, as this original notion had faded, when e. g. αὐλίσκος was merely 'a little flute,' and not something 'like a flute,' the diminutive ending might as well be applied when the primitive was conceived as designating a small class, and the individual or individuals referred to were thought of as small or young merely by comparison with

[1] Cf. Brugmann, Gr. 2. 1². 504.

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other classes, either because the class referred to falls far below the average size of objects, e. g. ἀστερίσκος 'a little star' because a star appears like a mere dot, or because the class is contrasted with other definite classes. So e. g. μειρακίσκος 'a young lad,' by contrast to adults, or σκιμποδίσκος 'a little low bed' in contrast to larger beds, and perhaps στρουθίσκος 'a little sparrow' in contrast to larger birds.

58. The diminutive use of -ισκο-, though more productive than the deteriorative, can scarcely be said to have been as characteristic as its use to denote similarity, and there are scarcely more than half as many appellatives in which the idea of small size is probably dominant. These belong to all periods, however, and already Hipponax has a number of certain diminutives in -ισκο-, while others belong to the later Classical and post-Classical periods.

59. As to the variety of 'diminutive' shadings, there is a difference between -ισκο- and -ιον in as much as the former is applied only to words of the most concrete kind, i. e. words representing visible or tangible objects of a distinct individuality.[1] There is no example of a word in -ισκο- designating a small quantity, as e. g. in -ιον σαρκίον 'a little piece of flesh,' no word applying purely to the realm of sound, as φωνίον 'a slender sound,' no diminutive of a primarily abstract word, like βηχίον 'a little coughing fit,' ᾄσμάτιον 'a little song,' or θωπευμάτιον 'a little piece of flattery.'

60. Within the narrower sphere of the use of -ισκο- thus described it is very much like -ιον, and the two suffixes no doubt influenced each other in their finer shades of meaning. And aside from this the nature of the primitive to which -ισκο- is applied caused similar modifications as for -ιον, and the pattern types, even though dating back to I. E. -ko-, must have brought with them other ideas besides small size, e. g. youth. Thus πτερίσκον (§ 56) was something that was not only too small, but also too young and too soft and downy to really deserve the name 'feather.' These finer shades will be largely brought out by distributing the diminutives into congeneric groups, to which I shall subordinate the really more fundamental difference between diminutives designating an individual as small compared to the normal of its class (designated A under each congeneric group) and diminutives designating an object as belonging to a small class (designated B).

[1] The same can be said of the suffix in all of its uses. There are no abstracts nor collectives nor words designating quantity. Cf. Janson, op. cit. 19.

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1. Names of Persons.

61. The idea of small size is sometimes accompanied or supplanted by that of youth, e. g. in μειρακίσκος 'a young lad,' νεανίσκος 'a (young) youth.' This is partly due do secondary association of youth with small size, since the two qualities usually vary analogously in case of living beings, partly to pattern types which designated a person or animal as too young to be designated by the primitive

A. *ἀκολουθίσκος*: ἀκόλουθος, said to be 'a little attendant' i. e. 'foot-boy' in Ath. 550 A. Cf. however Kaibel's note, who would substitute ἢ κορδυλίσκον or something like it for ἀκολουθίσκον, which is certainly unintelligible in the context. *ζακορίσκος*: ζάκορος, 'a little attendant,' very doubtful in Aglaïas Byz. in Rev. de Phil. (1846) 2. 1, p. 17 v. 23.

B. *κωραλίσκος*: κωράλιον, 'a (little) lad.' Phot. κωραλίσκον· τὸ μειράκιον. Κρῆτες. The same word as title of a comedy of Epilycus. *μειρακίσκος*: μειράκιον, 'a (young) lad.' Alex. frg. 3. 400 Ὁ δεσπότης οὑμὸς περὶ λόγους γάρ ποτε Διέτριψε μειρακίσκος ὢν καὶ φιλοσοφεῖν Ἐπέθετο. Plato Phaedr. 237 B ἦν οὕτω δὴ παῖς, μᾶλλον δὲ μειρακίσκος, μάλα καλός.[1] *νεανίσκος*: νεανίας, 'a (young) youth.' Since the word merely emphasizes the youth of the whole class there is usually no tangible distinction between it and its primitive. Dinoloch. frg. 4; Aesch. (Νεανίσκοι as title of a drama); Herod. 3. 53, 4. 149, 5. 13; Thuc. 8. 69. 4; Eupol. frg. 2. 565 (51); Plato Resp. 2. 375 A; Arist. Pol. 5. 4. 1303 b 21 γίγνονται μὲν οὖν αἱ στάσεις οὐ περὶ μικρῶν ἀλλ' ἐκ μικρῶν, στασιάζουσι δὲ περὶ μεγάλων.... μετέβαλε γὰρ ἡ πολιτεία ἐκ δύο νεανίσκων[2] στασιασάντων, ἐν ταῖς ἀρχαῖς ὄντων, περὶ ἐρωτικὴν αἰτίαν. *παιδαρίσκος*: παιδάριον, 'a little boy,' used by Schol. Ar. Thesm. 291 to explain ποσθαλίσκος. *παρθενίσκη*: παρθένος, 'a (young) virgin,' though mentioned only by the grammarian Arcad. 107. 15, because of the analogy of νεανίσκος probably belongs here, though possibly to A. *ποσθαλίσκος*: πόσθων, both comic words for 'little boy.' The diminutive in Ar. Thesm. 291, where the scholiast explains by παιδαρίσκος. The conglutinate -αλίσκος by analogy to κωραλίσκος (§ 109).

2. Names of Animals.

62. The notion of youth is combined with small size just as in names of persons, but scarcely that of descent, e. g. δελφινίσκος

[1] Here with an hypocoristic element.

[2] Perhaps here with a secondary deteriorative shade.

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'a little or young dolphin' can scarcely have been thought of as 'coming from a dolphin' because -ισκο- does not show the meaning 'descended from' in certain cases. Moreover, the fact that young animals when used as food are more tender and delicious than old ones, led to these accessory notions, which may become dominant, as e. g. in χηνίσκος, used of roast goose. To take care of this difference I subdivide both A and B: a) the animal is not conceived as food, b) it is so conceived.

Aa. *ἀλεκτορίσκος*: ἀλέκτωρ, 'a little cock.' Aesop. Fab. 369; Babr. ap. Suid. Ταναγραῖοι ἀλεκτορίσκοι. οἱ μαχηταὶ καὶ θυμικοὶ ὡς ἄνθρωποι. Βάβριος· ἀλεκτορίσκων ἦν μάχη Ταναγραίων, Οἷς φασιν εἶναι θυμὸν ὥσπερ ἀνθρώποις. *δελφινίσκος*: δελφίς, 'a little or young dolphin.' Arist. H. A. 9. 48. 631 a 17 δελφινίσκον μικρὸν τεθνηκότα... ὑπονέοντες καὶ μετεωρίζοντες (sc. οἱ δύο δελφῖνες). *κεστρινίσκος* 'a little κεστρῖνος (fish).' Clearch. ap. Ath. 332 C ἴσος ἐστὶ (sc. ὁ ἐξώκοιτος) τοῖς παραιγιαλίταις κεστρινίσκοις· οὗτοι δ' εἰσὶν ὀκταδάκτυλοι μάλιστα τὸ μῆκος. *κορακίσκος*[1]: κόραξ, probably 'a little or young raven.' Only Herodian 2. 445. 18.

Ab. *καπρίσκος*: κάπρος, 'a tender (little) boar.' Crobylus frg. 4. 567 (2) Αἰσχυνόμενον ἦπαρ καπρίσκου σκατοφάγου.[1] *χηνίσκος*: χήν, 'a delicious (little) goose.' Eubul. frg. 3. 211 (1. 3) τοῖς δὲ γενναίως πάλαι Διεσπάρακται θερμὰ χηνίσκων μέλη.

Ba. *ὀρθαγορίσκος*· χοιρίδιον μικρόν Hes. Cf. Ath. 139 B θύουσι δὲ καὶ τοὺς γαλαθηνοὺς ὀρθαγορίσκους. I assume that the primitive ὀρθαγόρας[2] was used in the same sense and is accidentally not quotable, so that -ισκο- would be used as in χοιρίσκος below. *στρουθίσκος*: στρουθός, 'a (little) sparrow.' Theod. Prodr. Carmen in Andronicum Comn. v. 125.[3]

Bb. *χοιρίσκος* 'a delicious (little) porker.' Insc. Andan. Ditt[2]. 653. 68 (91 B. C.) ἔστι δὲ ἃ δεῖ παρέχειν πρὸ τοῦ ἄρχεσθαι τῶν μυστηρίων· ἄρνας δύο λευκούς,... κριὸν εὔχρουν, καὶ... χοιρίσκους τρεῖς.

3. Plants or Parts of Plants.

63. The accessory elements of youth and tenderness or delicacy may be present just as with animals, only that in the extant examples the plant is not necessarily conceived as an article of

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[1] A conjecture of Porson for *καὶ πρίσκους καταφαγοῦ*.

[2] The derivation of *ὀρθαγόρας* itself does not concern us here.

[3] The passage is not accessible to me, and the word is placed here only because this would seem the most probable use.

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food, but the idea of delicacy is derived from small size also in other situations.

A. *βολβίσκος* : βολβός, 'a little bulbus.' Anth. P. 11. 35. *καλαμίσκος* : κάλαμος, 'a little stalk.' Ar. Ach. 1034 Σὺ δ' ἀλλά μοι σταλαγμὸν εἰρήνης ἕνα Ἐς τὸν καλαμίσκον ἐνστάλαξον τουτονί. *κλαδίσκος* : κλάδος, 'soft little twig.' Anacreont. 18. 4 Ἁπαλὰς δ' ἔσεισε χαίτας Μαλακωτάτῳ κλαδίσκῳ.

B. *κυπαιρίσκος* 'delicate (little) κύπαιρος,' a kind of marsh plant. Alcm. 38 μάργος δ' Ἔρως οἷα παῖς παίσδει Ἄκρ' ἐπ' ἄνθη καβαίνων . . . τῶ κυπαιρίσκω.

4. Geographical Words.

64. A. *αὐλωνίσκος* : αὐλών, 'a little valley.' Theophr. H. P. 9. 7. 1 Ὁ δὲ κάλαμος γίνεται καὶ ὁ σχοῖνος ὑπερβάλλοντι τὸν Λίβανον μεταξὺ τοῦ τε Λιβάνου καὶ ἄλλου τινὸς ὄρους μικροῦ ἐν τῷ αὐλωνίσκῳ τούτῳ. *λιμενίσκος* : λιμήν, probably 'a little harbor.' Gloss. *ποταμίσκος* : ποταμός, 'a little river.' Strabo 515. *ῥοΐσκος* : ῥόος, 'a little stream.' IGSI. 352. I. 16 ff. (after establishment of Roman rule).

5. Ornaments.

65. Whether the two following words belong here as referring to a class, whether e. g. δακτυλίσκος is really 'a little ring,' is uncertain, since -ισκος may be due to syncretism with -ιον, which is used in a number of similar words without trace of diminutive meaning.[1]

B. *δακτυλίσκος* : δακτύλιος, 'a (little) ring.' Insc. Boeot. (Lebadea), see Herwerden Lex. s. v. *ὁρμίσκος* : ὅρμος, 'a (little) necklace or collar.' Chares ap. Ath. 83 D κατασκευάζουσι δ' ἐξ αὐτῶν (sc. τῶν μαργαριτῶν) ὁρμίσκους τε καὶ ψέλια. Hes. ὁρμίσκοι· περιτραχήλιοι κόσμοι γυναικεῖοι. ἢ μανιάκης. ἢ περιδέραια. ἢ κλοιά. ἢ δακτύλιοι.

6. Vases, Vessels, Boxes.

66. A. *κοτυλίσκη* : κοτύλη, 'a little cup.' Pherecr. frg. 2. 282 (3) B. εἰ λάβω . . . . τὴν κοτυλίσκην ; A. μηδαμῶς Μικράν γε. *πινακίσκος* : πίναξ, 'a little plate or trencher.' Epigen. frg. 3. 537 (1) Εἶτ' ἔρχεται Χελιδονείων μετ' ὀλίγον σκληρῶν ἁδρὸς Πινακίσκος. Lynceus frg. 4. 433 (l. 6) παρέθηκε πίνακα γὰρ μέγαν, Ἔχοντα μικροὺς πέντε πινακίσκους ἐν οἷ. Probably also Insc. Del. Mich. 833. 126. *φορμίσκος* : φορμός, 'a little basket.' Plato Lys. 206 E ἠρτίαζον ἀστραγάλοις παμπόλλοις, ἐκ φορμίσκων τινῶν προαιρούμενοι. According to

[1] Cf. Gr. Dims. 96 f.

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E. M. 798. 52 there seems to be no diminutive force in the word: Φορμίσκοι · καλαθίσκοι. πλεκτὰ ἀγγεῖα.

B. *κοτυλίσκος*: κότυλος, 'a little cup.' Ar. frg. 2. 1105 Μηδὲ στέψω κοτυλίσκον.

7. Other Technological and Architectural Words.

67. A. *ἀνδριαντίσκος*: ἀνδριάς, 'a little statue.' Plut. Thes. 20 δύο δὲ μικροὺς ἀνδριαντίσκους ἱδρύσασθαι. CIA. 2. 678 B 70, 78 (378–366 B. C.); Insc. Del. Michel 833. 60 ἀνδριαντίσκος χρυσοῦς | σκέλος οὐδὲ χεῖρα ἔχων, ὁλκὴ δραχμαὶ ΓΗ ΙΙΙ. *αὐλίσκος*: αὐλός. a) 'a small reed or pipe.' Theogn. 241 Καί σε σὺν αὐλίσκοισι λιγυφθόγγοις νέοι ἄνδρες . . . Ἄισονται. Soph. frg. 701 Φυσᾷ γὰρ οὐ σμικροῖσιν αὐλίσκοις ἔτι, Ἀλλ' ἀγρίαις φύσαισι φορβειᾶς ἄτερ. Dionys. A. R. 7. 72. 5 ἀρχαϊκοῖς ἐμφυσῶντες αὐλίσκοις βραχέσιν. Poll. 4. 76 μικρός τις αὐλίσκος γοώδη καὶ θρηνητικὴν φωνὴν ἀφιείς. b) 'a little tube.' Arist. frg. 424. 1548 b 8 ψῆφοι δέ εἰσι χαλκαῖ αὐλίσκον ἔχουσαι ἐν τῷ μέσῳ. *ἀσπιδίσκη*: ἀσπίς, 'a little shield.' Hes. ἀσπιδίσκας · πελτάρια. σκουτάρια. *δολίσκος*: δόλος, 'a little device for deceiving,' 'a dagger.' Hes. *ἡλίσκος*: ἧλος, 'a little nail.' Ar. ap. Phot. ἡλίσκον τὸν μικρὸν ἧλον Ἀριστοφάνης. *κιονίσκος*: κίων, 'a little pillar.'[1] Ath. 514 C ὃν (sc. τὸν θρόνον) περιειστήκεσαν τέσσαρες κιονίσκοι λιθοκόλλητοι χρυσοῖ, ἐφ' ὧν διετέτατο ἱμάτιον ποικίλον πορφυροῦν. Joseph. A. J. 8. 3. 6. *κυλινδρίσκος*: κύλινδρος, 'a little cylinder.' Insc. Del. Mich. 833. 48 κυλινδρίσκος χρυσένδετος ἄστατος. *οἰκίσκη*: οἰκία, 'a small house.' Dem. 48. 13.[2] *πασσαλίσκος*: πάσσαλος, 'a little nail or peg.' Hipp. 671. 6; Galen. Lex. expl. πασσαλίσκῳ· τῷ σμικρῷ πασσάλῳ ὑποκριστικῶς. Polyb. ap. Suid. s. v. ἴδιον: ἄκροις γὰρ τοῖς ἀγωγεῦσι τῶν ἵππων πασσαλίσκους μικροὺς ἀπηρτηκότες. Particularly of a peg or pin in a musical instrument: Schol. Ar. Vesp. 574 κόλλοπες λέγονται οἱ πασσαλίσκοι τῆς κιθάρας εἰς οὓς ἀποδεσμοῦνται αἱ νευραί. Cf. also E. M. 525. 31. *σφηνίσκος*: σφήν, 'a little wedge.' Herond. 7. 22 ἡ πτέρνη 'Ορῇθ' ὅπως πέπηγε χὤτι σφηνίσκοις Ἐξηρτίωται πᾶσα. Moschop. and Proculus ad Hes. Op. 427 ἐμπέπηγε δὲ σφηνωθὲν διά τινων σφηνίσκων. *σωληνίσκος*: σωλήν, 'a little pipe.' Hero Spir. 222. *τριποδίσκος*: τρίπους, probably 'a little tripod.' CIA. 2. 766. 17; Insc. Boeot. CIG. 1570 b 15 τριποδίσκον, ὁλκὴ ΗΔΔΔΔΓΙΙΙΙ. *τροχίσκος*: τροχός, 'a little wheel.' Arist. Mech. 848 a 25.

B. *ἡλίσκος*: ἧλος, 'a (little) nail.' Ar. ap. Poll. 10. 61 τὸν γὰρ

[1] Perhaps with the notion 'not a real pillar.'

[2] *οἰκίσκην* as cited by Pollux, otherwise *οἰκίαν*.

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ἧλον καὶ ἡλίσκον[1] ἐν Ἥρωσιν Ἀριστοφάνης κέκληκε. *πασσαλίσκος*: πάσσαλος, 'a (little) nail or peg,' designates the same object as its primitive in Hero Autom. 2. 5.[1] *σκιμποδίσκος*: σκίμπους. The primitive itself designates a small couch or low bed, the diminutive being used in contrast to higher and larger beds. Synes. 23 D τοὺς χθαμαλοὺς σκιμποδίσκους ὀκλαδίας ἐπὶ τῶν ὤμων ἀνατιθέμενοι. Nicetas Chon. Annal. p. 155 A. Ἐπί τινος μετεώρου σκιμποδίσκου. *σφελίσκον*: σφέλας, 'a (little or low) foot-stool,' probably in contrast to chairs. Insc. Sam. Hoffm. 3. 169. 50.

8. Miscellaneous.

68. A. *ἀρτίσκος*: ἄρτος, a 'little loaf.' Schol. Ar. Pax 1196 μικροὶ ἀρτίσκοι. Ath. 139 A ὅς (sc. ὁ φυσίκιλλος) ἐστιν ἀρτίσκος ἐγκρίδι παραπλήσιος. *ἱμαντίσκος*: ἱμάς, 'soft little strap' of a shoe. Herond. 6. 71 οἱ δ' ἱμαντίσκοι Ἔρι', οὐχ' ἱμάντες. *οἰνίσκος*: οἶνος, 'young wine,' with personification in Cratin. frg. 2. 117 (3) ἦν ἴδῃ Μενδαῖον ἡβῶντ' ἀρτίως Οἰνίσκον, ἕπεται καὶ ἀκολουθεῖ καὶ λέγει· Οἴμ' ὡς ἁπαλὸς καὶ λευκός. ἄρ' οἴσει τρία; Eubul. frg. 3. 265 (8) Οἰνίσκος οὔπω πότιμος. *πιλίσκος*: πῖλος, probably 'a little felt cap.'[2] Diosc. 3. 4 ἄνθη λευκὰ οἱονεὶ πιλίσκους. *πλοκαμίσκος*: πλόκαμος, probably '(soft little) tresses.' Theod. Prodr. Epigr. p. 114.[3] *πτερίσκον*: πτερόν, 'a little feather.' Babr. 118. 5 νεοσσῶν ... Οὔπω πτερίσκοις πορφυροῖς ἐπανθούντων. *σκελίσκον*: σκέλος, 'a light little leg.' Ar. Eccl. 1167 καὶ τάσδε νῦν λαγαρὰς Τοῖν σκελίσκοιν τὸν ῥυθμόν.

B. *ἀστερίσκος*: ἀστήρ, 'a (little) star.' Call. frg. 94 τῆς ἁμάξης ... σταθμήσασθαι Τοὺς ἀστερίσκους.

9. Modifications of the Diminutive Meaning.

69. Of the various associated and accessory diminutive meanings as well as of those that have been inherited from certain pattern types the notions of youth, deliciousness, and tenderness or delicacy were mentioned § 61 ff. Not very different from the latter are those words in which -ισκο- means 'soft, delicate, luxurious, or elegant,' a notion which on the one hand may come from small size or youth, e. g. in πτερίσκον (§ 68) 'a soft, downy, little feather,' where softness is naturally associated with the small size of the first feathers of a young bird. Sometimes, again, these

[1] Though the derivatives are equivalent to their primitives this does not *necessarily* make them diminutives referring to a class, since they may be due to congeneric attraction by some other word.

[2] If 'a little piece of felt' it would be the only exception to § 59.

[3] Uncertain. The passage is not accessible to me.

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ideas may proceed from the hypocoristic use of the suffix, since endearment and beauty and elegance are often associated. Other examples of this meaning follow. *ἱμαντίσκος* 'a soft little strap' (§ 68). *σαμβαλίσκον* 'neat (little) sandal.' Herond. 7. 125 Γυναῖκες, ἢν ἔχητε κἠτέρων χρείην Ἢ σαμβαλίσκων ἢ ἃ κατ' οἰκίαν ἕλκειν Εἴθισθε. *σινδονίσκος* 'delicate σίνδων (a kind of cloth). Insc. Sam. Hoffm. 3. 169. 25 σινδονίσκος ὑπογεγραμμένη. *στεφανίσκος*: στέφανος, 'delicate little wreath.' Anacr. 54 Ἐπὶ δ' ὀφρύσιν σελίνων στεφανίσκους Θέμενοι. Anacreont. 40. 5 Στεφανίσκους δ' ὑακίνθων Κροτάφοισιν ἀμφιπλέξας. ib. 42. 15 Ῥοδίνοισι στεφανίσκοις Πεπυκασμένος χορεύσω. Probably *στεφανίσκη* : στεφάνη, mentioned without context by Theognost. Can. 110. 5, was used just like στεφανίσκος. Probably also the late *λινίσκος* : τὸ λίνον 'linen,' explained Eustath. 1161 ὑποκοριστικῶς τὸ λεπτότατον λίνον.

70. In *σκελίσκον* (§ 68 A) we find the idea of lightness of foot dominating and perhaps supplanting that of small size. The former is of course conditioned on the latter and therefore closely associated.

71. The use of diminutives to represent an object as small when asking for it, so as to minimize the favor,[1] is found in four words in -ισκο- : καλαμίσκος 'a little stalk' (§ 63 A)[2]; *ἀσκερίσκον* : ἀσκέρα 'a winter shoe for inside'; *σαμβαλίσκον* : σάμβαλον 'sandal'; and *κυπασσίσκος* : κύπασσις 'a short frock or coat.' The last three are all found in Hipponax 18. Δὸς χλαῖναν Ἱππώνακτι καὶ κυπασσίσκον Καὶ σαμβαλίσκα κἀσκερίσκα καὶ χρυσοῦ Στατῆρας ἑξήκοντα τοὐτέρου τοίχου.

10. Secondary Diminutives.

72. Sometimes a word in -ισκο-, though of non diminutive origin, may be placed in such a situation, particularly if in the neighborhood of another diminutive or an adjective meaning 'small,' that its own suffix suggests small size also. If such a word in -ισκο- differs from the primitive in meaning, the notion of small size would be an addition to the sense, e. g. γλαυκίσκος, used of a certain fish with the idea 'like' its primitive (§ 36 A), may suggest by its suffix the notion of a small thing in Arched. frg. 4. 436 (2. 1) Δραχμῶν τριῶν γλαυκίσκον 'a mere γλαυκίσκος for three drachmas!' Similarly *χιτωνίσκος* 'not a real χιτών, but only like it' (§ 40), 'a short frock,' could have been felt also as dimin-

[1] Cf. Gr. Dims. 163.

[2] In this case indirectly. The stalk is represented as small because it will contain only a small quantity of the desired peace.

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utive in Antiphan. frg. 3. 17 Λευκὴ χλανίς, φαιὸς χιτωνίσκος καλός, Πιλίδιον ἁπαλόν (with the notion of elegance, see § 69). Plato Legg. 12. 954 A γυμνὸς ἢ χιτωνίσκον (merely a χ.) ἔχων ἄζωστος. Dem. 21. 216 μικροῦ γυμνὸν ἐν τῷ χιτωνίσκῳ γενέσθαι. When on the other hand the derivative does not differ from the primitive at all, the former on reinterpretation becomes a diminutive pure and simple. So *ὀβελίσκος* = ὀβελός 'spit' is felt as a diminutive in Insc. Del. Mich. 833. 128 ὀβελίσκοι μικροὶ ΔΔΔΓ.

11. Faded Diminutives.

73. The ideas of small size, youth, etc. can fade in two ways. When the diminutive refers to an individual as compared to a class it takes place if a word originally formed with the notion of small size uppermost and yet designating something looked upon as different from the primitive is no longer analyzed, as if e. g. κιονίσκος 'a little pillar' would no longer be referred to its primitive κίων, but would come to be recognized as an altogether different architectural concept. In the nature of the case such words can not be separated from others formed with the notion of similarity uppermost (§ 32), or from the pattern types of the diminutives (§ 56). In all three instances the result is the same: the derivative designates a smaller object looked upon as different from the primitive, and the idea 'little' may be absent.

74. When the diminutive refers to a class, fading takes place very easily because in want of strong indications of contrast of size between the diminutive and another class the hearer will often not follow the speaker when the latter uses such a diminutive. Most of the words given above as referring to a class will illustrate. *μειρακίσκος* : μειράκιον, diminutive because any lad is young compared to an adult, is not felt as a diminutive e. g. in Plato Theag. 122 C, where without contempt and apparently without endearment a youth present at the conversation is referred to as ὁ μειρακίσκος οὗτος. *νεανίσκος* becomes a synonym of νεανίας 'youth' as early as Herodotus, and later is almost never used with conscious diminutive force, and Aeschines does not use the primitive at all. Cf. also Poll. 2. 4, where νεανίσκος also supplants νεανίας: ἡ τετάρτη (sc. ἡλικία) νεανίσκος. A good example of the use of the word without 'diminutive' elements is Xen. Hell. 2. 3. 23 παραγγείλαντες νεανίσκοις οἳ ἐδόκουν αὐτοῖς θρασύτατοι εἶναι... παραγενέσθαι. If *ἡλίσκος* (§ 67 B): ἧλος 'nail' was a diminutive, its force faded in the same way, similarly *πασσαλίσκος* (§ 67 B). Direct proof of fading we have in *σφελίσκον* = σφέλας 'foot-stool'

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(§ 67 B).[1] It is found in a catalogue: 48 κλιντηρίσκος, 50 Ἥρηι σφελίσκον, 52 μαχαιροθήκη.

VI. *-ΙΣΚΟ-* AS A HYPOCORISTIC SUFFIX.

75. Like most diminutive suffixes -ισκο- shows various hypocoristic shades of meaning which are often intimately associated with the notion of small size, but may take its place. In a suffix whose 'diminutive' meaning developed from similarity there seems to be no probable way by which the notion 'neat,' 'pretty,' or 'dear' could be derived from anything except 'small.' We can hardly assume that the idea was originally 'too neat or pretty or dear for the primitive to be applicable.'[2] On the other hand appreciation of delicacy and endearment for children and young animals are so common that these hypocoristic shades may easily attach themselves to any expression referring to their small size or youth. This secondary derivation of hypocoristic notions from small size is not only characteristic of -ισκο-, be it that it has passed through this development independently, or that it has inherited all the types by syncretism with -ko-, but the same is true of the latter itself. In this way is to be explained the almost total absence of the use of Skt. -ka- to express endearment in the Veda,[3] there being only three examples in the Rigveda, and there probably combined with the notion of small size, if indeed that be not the only idea. At that early age endearment was scarcely as yet consciously connected with the suffix.

76. The various hypocoristic words in -ισκο- can be divided into several groups according to the exact shade of meaning and origin. In § 62 was mentioned the notion of deliciousness of articles of food, derived from youth in names of animals and plants. This use became productive in words where no idea of youth could ever have been present, e. g. ἀμητίσκος 'a fine milk-cake.' Quite similar is the use of a 'diminutive' suffix in the meaning 'delicate, elegant, luxurious,' etc., the origin of which is discussed § 69. These meanings shade so gradually from the diminutive

[1] If it refers to the class, but possibly it designates a particularly little foot-stool.

[2] The closest approach to such a development would be *πτερίσκον* (§ 68 f.), perhaps a feather which was 'too soft for the name.' It must be borne in mind, however, that this is not yet really a hypocorism, since there is no evidence of any emotion connected with the idea.

[3] Cf. Edgerton, JAOS. 31. 131 ff.

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to the hypocoristic that there is no possibility and in fact no desirability of an exact separation. In the same category would also come the use of -ισκο- in *μελίσκον* : μέλος, 'elegant or beautiful (little) song,' in Alcm. 65 Ὡς ἁμὲς τὸ καλὸν μελίσκον.

77. Endearment on the other hand is usually prominent in hypocorisms of names of persons and animals, e. g. δεσποτίσκος [1] 'dear master,' κορίσκη 'dear maiden,' sometimes in names of parts of the body of persons thought of with endearment. But since endearment is often coupled with the notion of certain admired qualities like beauty, there again is no sharp line of distinction between this meaning and the one of the last paragraph, i. e. the idea of beauty is often present and may be dominant in any 'diminutive' like the above named κορίσκη.

78. The various hypocoristic uses of -ισκο- were fully developed when the suffix first appeared in literature. From Alcman of the seventh century we have μελίσκον just quoted and κομίσκᾱ 'lovely hair.' In Attic κορίσκη e. g. occurs in the Comic poet Plato and δεσποτίσκος in Euripides. The flourishing period for this use seems to have been the Classical period even more than for the deteriоratives and diminutives. In Alexandrian times there are new words with the notion of endearment to be found: Σατυρίσκος, φιλίσκος, ποδίσκος, and perhaps τραγίσκος, but after that I have found only two new hypocoristic words, which, however, are both faded and used exactly like their primitives, belonging to the category of articles of food: πλακουντίσκος 'flat-cake' and τυρίσκος 'cheese.'

1. The suffix expresses Daintiness.

79. Those words in which the idea of small size can be present, e. g. names of animals and plants, were mentioned § 62 f. There remain such as are totally independent of the idea 'small,' e. g. a little cake is not a bit more delicious than a large one.

Collection of Examples. *ἀμητίσκος* : ἄμης 'milk-cake.' Telecl. frg. 2. 362. Ὀπταὶ δὲ κίχλαι μετ' ἀμητίσκων εἰς τὸν φάρυγ' εἰσεπέτοντο. *θριδακίσκᾱ* 'a kind of cake' : θρῖδαξ.[2] Alcm. 20 θριδακίσκας τε καὶ κριβανωτώς. *κρεΐσκον* : κρέας 'meat.' Alex. frg. 3. 472 (4) Τριωβόλου κρεΐσκον ἀστεῖον[3] πάνυ Ἥειον. *μαζίσκη* : μᾶζα 'cake of barley.' Ar. Equ. 1105 Ἐγὼ δὲ μαζίσκας γε διαμεμαγμένας Καὶ

[1] Here totally without notion of small size. It refers to the giant Cyclops.

[2] *θρῖδαξ* occurs only in the meaning 'lettuce,' but probably designated a cake in the dialect of Alcman. Cf. the Attic *θριδακίσκη*, which also had both meanings, as is stated by Hes. s. v.

[3] Cf. § 18.

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τοὔψον ὀπτόν (sc. ποριῶ). ib. 1166 Ἰδοὺ φέρω σοι τήνδε μαζίσκην ἐγώ. *ναστίσκος* : ναστός (sc. πλακοῦς) 'cheese-cake.' Pherecr. frg. 2. 316 (l. 7). Ἀπὸ τῶν δὲ τεγῶν ὀχετοὶ βοτρύων μετὰ ναστίσκων πολυτύρων Ὀχετεύσονται. *πινακίσκος* : πίναξ, 'a delicious trencher,' by metonymy, referring to its contents. Pherecr. frg. 2. 300 Σχελίδες δ' ὁλόκνημοι πλησίον τακερώτατοι Ἐπὶ πινακίσκοις. *πλακουντίσκος* : πλακοῦς 'flat-cake.' E. M. 533. 22 Καὶ ἄθλα οἱ νικῶντες ἐλάμβανον πλακουντίσκους[1] πυραμοῦντας ἢ σησαμοῦντας. *τυρίσκος* : τυρός 'cheese.' Ael. N. A. 8. 5 καὶ ἀλφίτοις μαντεύονταί τινες καὶ κοσκίνοις καὶ τυρίσκοις.[1]

2. The suffix expresses Endearment.

80. Endearment is most pronounced and mere appreciation of beauty least so when the person is addressed directly, i. e. when the vocative case is used. So *δεσποτίσκος* : δεσπότης 'master.' Eur. Cycl. 267 Ἀπώμοσ' ὦ κάλλιστον ὦ Κυκλώπιον, Ὦ δεσποτίσκε, μὴ τὰ σ' ἐξοδᾶν ἐγὼ Ξένοισι χρήματα. *μειρακίσκη* : μεῖραξ 'girl,' ironically in Ar. Plut. 963 (§ 47). *νεανίσκος* : νεανίας 'young man' in Ar. Thesm. 134 Καὶ σ' ὦ νεανίσχ' ὅστις εἶ... ἐρέσθαι βούλομαι. *Σατυρίσκος* : Σάτυρος, as a term of endearment of a shepherd lass to her lover in Theocr. 27. 3 Μὴ καυχῶ, σατυρίσκε,[2] κενὸν τὸ φίλαμα λέγουσιν. ib. 49 Τί ῥέζεις σατυρίσκε ; *φιλίσκος* : φίλος 'friend.' Teles ap. Stob. 516. 19 Ἐγώ μοι δοκῶ, ὦ φιλίσκε,[3] γράφειν εἰς σὲ προτρεπτικόν.

81. Persons are spoken of with endearment in the third person, largely with the idea of beauty mingled, in the following cases : *κορίσκη* : κόρη 'maiden.' Plato Com. frg. 2. 638 (l. 12) Αὐλοὺς δ' ἔχουσά τις κορίσκη Καρικὸν μέλος τι Μελίζεται τοῖς συμπόταις. Timocl. frg. 3. 607 Ὅσον τὸ μεταξὺ μετὰ κορίσκης ἢ μετὰ Χαμαιτύπης τὴν νύκτα κοιμᾶσθαι, βαβαί. *κορίσκος* : κόρος 'youth,' used to denote any supposed person, just like the Engl. Johnny, must have been hypocoristic in origin. Arist. De part. An. 1. 4. 644 a 25, Phys. 4. 11. 219 b 21. *μειρακίσκη* : μεῖραξ 'maiden, lass.' Ar. Ran. 411 μειρακίσκης... καὶ μάλ' εὐπροσώπου. *μειρακίσκος* : μειράκιον 'lad.' Plato Phaedr. 237 B μειρακίσκος μάλα καλός. *νεανίσκος* : νεανίας 'young man.' Lys. 32. 19 ἵνα τοὺς μὲν νεανίσκους διὰ τὸ μέγεθος τῶν συμφορῶν ἐλεήσητε.[4] Plato Symp. 211 D κατὰ χρυσίον τε καὶ ἐσθῆτα καὶ τοὺς

[1] Faded.

[2] Since used in a teasing way there is also a deteriorative element.

[3] Addressed to Themison the king of Cyprus.

[4] In situations like this one I still believe (cf. Gr. Dims. 178 f.) that pity is merely the occasion for the expression of endearment, and that it is scarcely proper to make a category 'diminutives of pity,' as is done by Edgerton, JAOS. 31. 132.

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καλοὺς παῖδάς τε καὶ νεανίσκους. id. Resp. 2. 375 A Οἴει οὖν τι ... διαφέρειν φύσιν γενναίου σκύλακος εἰς φυλακὴν νεανίσκου εὐγενοῦς; id. Theag. 122 D τί καλὸν ὄνομα τῷ νεανίσκῳ; Insc. Epid. Ditt³. 802. 118 (3 d cent. B. C.) νεανίσκον εὐπρεπῆ τὰμ μορφάν. *παιδίσκη*: ἡ παῖς 'girl.' Ar. Ach. 1148 καθεύδειν Μετὰ παιδίσκης[1] ὡραιοτάτης. *παιδίσκος*: ὁ παῖς 'boy' 'servant.' Philoxen. 1. 2 ἁπαλὸς παιδίσκος ἐν ἀργυρέᾳ προχόῳ φέρων ἐπέχευεν.

82. There are two hypocoristic words in -ισκο- designating parts of the body, in both of which the notion of beauty is prominent. *κομίσκᾱ*: κόμᾱ 'hair.' Alcm. Parth. 101 ἁ δ' ἐπιμέρῳ ξανθᾷ κομίσκᾳ. *ποδίσκος*: πούς 'foot.' Anacreont. 28. 4 Ὁ δ' Ἔρως ἔχων μόλιβδον Περὶ τοῖς καλοῖς ποδίσκοις Ἐδίωκε. Herond. 7. 94 Οὔ σοι δίδωσιν ἡ ἀγαθὴ Τύχη, Κέρδων, ψαῦσαι ποδίσκων ὧν Πόθοι τε κἤρωτες ψαύουσιν; ib. 113 Φέρ' ὧδε τὸν ποδίσκον.

83. Endearment for animals seems to be expressed by the two following words: *κυνίσκη*: ἡ κύων 'bitch.' Ar. Ran. 1360 Ἅμα δὲ Δίκτυννα παῖς Ἄρτεμις καλὰ Τὰς κυνίσκας[2] ἔχουσ' ἐλθέτω Διὰ δόμων πανταχῇ. *τραγίσκος*: τράγος 'he-goat.' Theocr. 5. 141 φριμάσσετο πᾶσα τραγίσκων Νῦν ἀγέλα, a call upon the goats to help celebrate a victory. Possibly the τραγίσκος of § 46 is a childish hypocorism, though I incline toward deteriorative interpretation. In Anth. P. 9. 317 τραγίσκος is probably equivalent to its primitive.

84. In one instance we have a hypocorism in -ισκο- used with enallage, i. e. the endearment expressed by the suffix seems not to be directed to the object designated by the word itself, but to something in the context. This is *ἱερακίσκος*: ἱεραξ 'hawk' in Ar. Av. 1112 Κἂν λαχόντες ἀρχίδιον εἶθ' ἁρπάσαι βούλησθέ τι, Ὀξὺν ἱερακίσκον ἐς τὰς χεῖρας ὑμῖν δώσομεν. The birds are coaxing for the support of the audience: "If you have been chosen by lot for a little office and you wish to filch a little something, we will give you a nice little hawk into your hands."

VII. APPARENT CASES OF OTHER MEANINGS.

85. Semantic syncretism with -ko-, which may have been influential in Germanic adjectives (§ 11) to give -isko- meanings like 'coming from,' 'belonging to,' has had no further influence on Gr. -ισκο- than perhaps to assist in the development of 'di-

[1] If *παιδίσκη* here designates a servant the hypocoristic element is secondary.

[2] The scholiast says: *κυνίσκας· ἀντὶ τοῦ τὰς κύνας.*

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minutive ' meanings. The latter uses along with its use to designate similarity are the only ones that can be found in the Classical period, but since -ko- in Greek was not a living 'diminutive' suffix nor often a suffix of similarity, there rarely was any contact with -ισκο-, and further syncretism of the two suffixes was out of the question. Any spread of the latter to meanings more remote from its original one must be due to different causes, either syncretism with Greek -ιον or congeneric association or both.

86. That, however, such meanings as ' belonging to,' ' coming from,' ' made of ' were ever consciously connected with the suffix is not at all probable. The vague feeling of equivalence of -ιον, which certainly had all of these adjectival meanings in addition to its ' diminutive ' uses, caused certain words of analogical relation between primitive and derivative to be formed by -ισκο- if a certain pattern in -ιον existed, or one word in -ισκο- brought forth another one which was synonymous or belonged to the same congeneric group even though the new word did not show a meaning previously found in the suffix. But there is no case where the freedom of forming new words with suffixal meanings outside of the limits just mentioned shows that these adjectival meanings were actually felt. I arrange the words in question then according to the *apparent* meaning of the suffix, though it will be clear that the cause of its addition was something else than a feeling for such meanings.

87. In the first place there are quite a number of words in -ισκο- which are indisputably equivalent to their primitives, aside from the names of vessels mentioned § 41. It might be supposed that all of these, like a number of similar words in -ιον, went back to the meaning ' belonging to the category of,' that e. g. λεκανίσκη was a vessel ' belonging to the category of λεκάνη,' ' a vessel of the plate kind.' But there is no evidence whatever for a feeling for such usage at any stage of the language, and these words are due to congeneric attraction, following other words in which -ισκο- implied similarity or faded diminutives. Similarly the following words: *δερρίσκος* (CIA. 2. 678 B 73) δερρ[ί]σκοι IIII (378–366 B. C.) seems to be equivalent to δέρρις ' leather covering or coat,' and if so, it followed χιτωνίσκος (§ 40) in its ending as well as gender, as did also *τριμίσκος* = ὁ τρίμιτος. Cf. Hes. τριμίσκον· ἱμάτιον. Ἀσπένδιοι. *λημνίσκος* ' a kind of fillet,' seems to have been influenced in its ending and gender by the congeneric στεφανίσκος ' wreath or crown.' Its primitive, however, is not found, but we may refer it to a *λημνίον on the basis of διλήμνιον, or else to

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*λήμνη. In either case the loss of the primitive shows that it could not have been felt as a diminutive. It occurs e. g. in Hes. λημνίσκους· τὰς ταινίας Συρακούσιοι. Polyb. 18. 29. 12 στεφάνους ἐπιρριπτοῦντες καὶ λημνίσκους. Also in an Attic inscription Ditt³. 633. 25 (4th cent. B. C.). As a noose for birds Ath. 200 C, and as a surgical bandage Heracl. ap. Galen. and Paul. Aeg. 6. 24. *σπληνίσκον* = σπληνίον 'bandage' was in turn influenced by λημνίσκος in its last use, i. e. if the later appearance of the latter is due to accident. σπληνίσκον is found in Hipp. 467. 42 and the Samian inscription of Hoffm. 3. 169. 24 f. *τορνίσκος* 'a pair of compasses' = τόρνος. Cf. Philo in Math. Vett. p. 53. 4. This word and *τρυπανίσκος* (Martyrium in Actis SS. Maji vol. 4, p. 624) 'borer' = τρύπανον evidently followed certain names of tools of § 42, which were largely equivalent to their primitives, e. g. μοχλίσκος or ὀβελίσκος. *στροβανίσκος*· τρίπους Hes. is obscure because no primitive is found, yet it must have followed τριποδίσκος (§ 67). We do not know whether *στροβανός,[1] which is to be assumed as primitive, was a substantive of the same meaning or an adjective. Finally there are two words in -ισκο- designating chambers which are equivalent to their primitives: *κοιτωνίσκος* (Artemid. 4. 46; Anna Comn. 361 A; Schol. Z 316 θάλαμος, ὅ ἐστι νυμφικὸς κοιτωνίσκος) = κοιτών, and *οἰκίσκος* (Herodian 7. 9 εἰσελθὼν μόνος εἰς τὸν οἰκίσκον ὡς δὴ καθευδήσων) = οἶκος. The cause was probably syncretism with -ιον through the synonym δωμάτιον, in which -ιον however had the meaning 'belonging to' the house (δῶμα). Since οἶκος, like δῶμα, could also mean 'house' as well as 'chamber,' there was an analogical relation between primitive and derivative in δωμάτιον : δῶμα and οἰκίσκος : οἶκος, while κοιτωνίσκος followed the latter.

88. Apparent cases of the meaning 'belonging to' are the following: *βουβωνίσκος* (Oribas. p. 111 f. Mai.) 'a truss for inguinal hernia': βουβών 'inguen,' 'that which belongs to the inguen'; *γαρίσκος* (Marcell. Sid. 33) an unknown fish: γάρος 'a sauce made of brine and small fish,' 'that which is used for or belongs to the brine sauce'; *θυΐσκη* (LXX 1. Macc. 1. 22) and *θυΐσκος* (Joseph. A. J. 3. 6. 8): θύος 'incense,' 'that which is connected with or used for incense'; *Πανίσκος* (Cic. De nat. deor. 3. 17. 43) 'an attendant of Πάν,' 'he who belongs to Pan.' For the second, third, and fourth the influence of congeneric attraction is clear enough: γαρίσκος followed names of fish like γλαυκίσκος (§ 36 A), and θυΐσκη

[1] Janson, op. cit. 5, thinks the whole word is foreign, as may well be. Cf. *ἰβίσκος* (§ 38 and note).

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-ος other names of vessels like κοτυλίσκη or κοτυλίσκος (§ 41). As to βουβωνίσκος we may assume influence of words meaning bandages, e. g. λημνίσκος, assisted by syncretism with -ιον. The form in -ισκο- would gain currency because βουβώνιον was already preempted by being the name of a plant acting as a remedy to the βουβών, also with the idea of appurtenance. Πανίσκος, finally, may have been some one 'like Pan, but not a real one,' or a 'little Pan.'

89. The apparent meaning 'coming from' is found in *μαγαρίσκος*· πινακίσκος Hes.: *Μάγαρα [1] = Μέγαρα, μαγαρίσκος seeming to be 'that which comes from Megara,' i. e. 'Megarian pottery,' and is equivalent to μεγαρικὸς κέραμος. The patterns again were the many names of vessels in -ισκο- (§ 41).

90. In two examples our suffix seems to mean 'made of,' both in Herondas, and therefore earlier than the preceding: *κανναβίσκον* (7. 58) 'a kind of shoe': κάνναβις 'hemp,' 'that which is made of hemp,' and *σανίσκη* (4. 62) 'tablet for painting' [2]: σανίς 'board, plank,' 'that which is made of boards or planks.' But since the primitive of the latter is itself found in the meaning of 'tablet,' it is probable that it was thus conceived in the formation of the derivative, which therefore was either 'that which is like a σανίς,' or was equivalent to it, following related words like πινακίσκος (§ 41). The latter itself, which might be thought of as 'that which is made of flat-wood (πίναξ)' is certainly a deteriorative (§ 53) and diminutive (§ 66) of πίναξ when itself meaning 'platter.' If, however, it attracted σανίσκη, it was also used just like πίναξ and πινάκιον of a tablet for painting, and that meaning is accidentally not quotable. It was caused by semantic syncretism with the -ιον word. κανναβίσκον on the other hand was attracted by ἀσκερίσκον or σαμβαλίσκον, both designating shoes (§ 71). It is possible, however, that the real primitive was καννάβιον, which itself designates a hempen shoe, and then there would be equivalence of primitive and derivative.

91. In one word -ισκο- appears as a compound forming suffix: *παραγωνίσκος* 'a carpenter's square' (LXX): παρά 'alongside' and γωνία 'angle,' 'that which is alongside of the angle.' The responsible congeneric word was some name of a tool like μοχλίσκος (§ 42), τρυπανίσκος (§ 67), or τορνίσκος (§ 87). The same group, more particularly the surgeons' tools, caused *κοιλίσκος* (Hes.)

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[1] With the vowel assimilation in **Μάγαρα* < *Μέγαρα* cf. *μάγαρον* (Men.) < *μέγαρον*, and *λακάνη* < *λεκάνη*. See Brugmann, Gr. Gr[4]. 84.

[2] So Crusius and Meister ad loc.

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= κοῖλος ἐκκοπεύς 'a hollow i. e. scoop-shaped knife' for surgical purposes. The primitive is the adjective κοῖλος.

92. There is left the one word ἀνθρίσκος [1] in which -ισκο- might be thought of as a suffix of possession, in as much as it might be 'that which is provided with flowers,' a certain umbelliferous plant. Cf. Hes. ἀνθρίσκιον· λάχανον ἔχον ἄνθος ὡς ἄνηθον. One would expect a primitive *ἄνθρον or *ἀνθήρ, but none is known to have existed, and moreover, the earlier form (in Sappho and the Comic poets Cratinus and Pherecrates) was ἄνθρυσκον. This shows that the ἀνθρίσκος of Poll. 6. 106 as well as ἀνθρίσκιον of Hesychius was remodelled from the old form in -υσκον, and that we therefore need not look for any real meaning of -ισκο-.

93. Our conclusions can be summarized as follows. Apparent cases of all meanings except 'diminutive' uses and the designation of similarity are later than the Classical period, and never were consciously attributed to the suffix. Words which seem to show these meanings are all due do congeneric attraction or to the substitution of -ισκο- for -ιον because of the general feeling of equivalence of the two suffixes. None of these uses gained any productivity whatsoever so as to show that a feeling for them really existed. A number of words in -ισκο-, however, from the Classical period on, did not differ from their primitives.

VIII. PROPER NAMES IN *-ΙΣΚΟ-*.

94. I have reserved for a particular chapter the proper names in -ισκο- because they present distinct peculiarities of their own apart from the appellatives, and because they form a congeneric group whose relationship is much more important than the different ways in which the suffix modifies the primitive.

95. I am referring, however, principally to the personal names; for the geographical names are rare and largely uncertain. Many of them are merely foreign names which happen to have been used by Greek writers, and these of course can not concern us directly. Thus the Keltic names like Σκορδίσκοι (Strabo), Ταυρίσκοι (St. B.), and Τευρίσκοι (Strabo) do not interest us except as they bear on I. E. -isko- (§ 2 f.), neither do the Italic Φαλίσκοι and Φαλίσκον, nor various names of towns and rivers in Asia Minor and near the Danube, e. g. Ζαλίσκος [2] (Ptol.) a river in Paph-

[1] Words which end in *-ισκο-* which is not wholly suffixal do not concern us. So *δίσκος* (Janson, op. cit. 4) and *ῥίσκος* (ib. 5).

[2] Pape translates 'Schierenbeck,' referring to *ζάλη*, which is uncertain because we are not sure of the Greek origin of the name.

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lagonia, (Σ)καρίσκος (Arist., Ael.) a river of the Budini in Scythia, Πάρτισκον (Ptol.) a city of the Iazyges Metanastae, Σεκούρισκα (Procop.) a city in Moesia, also Κούρισκα in Theophylactus, Τευρίσκοι (Ptol.) a people in Dacia, Τίβισκα (Ptol.) a city in Moesia Inferior, Τίβισκος (Ptol.) a tributary of the Danube, Τίρισκον (Ptol.) a city in Dacia, Τρομάρισκα (Ptol.) a city in lower Moesia. All of these words were either taken from foreign languages including the suffix, or they ended in such a way as to suggest the Gr. -ισκο-, and were remodelled accordingly.

96. Geographical names from Greece proper I have found only two, in the first place in St. B. Τριποδίσκος καὶ Τριποδίσκοι· κώμη τῆς Μεγαρίδος. λέγεται καὶ Τριποδίσκη. The reason for the name is given Paus. 1. 43. 8 τρίποδα δὲ ἀράμενον φέρειν ἐκέλευεν (sc. ἡ Πυθία τὸν Κόροιβον) ἐκ τοῦ ἱεροῦ, καὶ ἔνθα ἂν ἐκπέσῃ οἱ φέροντι ὁ τρίπους, ἐνταῦθα Ἀπόλλωνος οἰκοδομῆσαι ναὸν καὶ αὐτὸν οἰκῆσαι . . . καὶ Τριποδίσκους κώμην ἐνταῦθα οἰκῆσαι. It is thus seen that the suffix -ισκο- had nothing to do with the fact that the word is a geographical name, but the whole word was transferred to the city by association. Certainly of Greek origin was also Ἱππουρίσκος (St. B.) an island off Caria. Its primitive is ἵππουρις 'horse-tail,' and the suffix no doubt expressed similarity.

97. From Macedonia and Thrace, however, I have found seven geographical names in -ισκο-, partly Greek words without doubt, partly native. The variety of the relations between primitive and derivative indicates that the suffix had lost all content except the feeling that it was a suffix for forming geographical names. Thus we find two derivatives from adjective primitives: Ἐλευθερίσκος (Theag. ap. St. B.): ἐλεύθερος 'free,' a city in Macedonia, and Βερτίσκον (Strabo, Ptol.) a mountain of Macedonia: φέρτιστος 'best,' Greek φ corresponding to Macedonian β.[1] The meaning 'belonging to' apparently in the Macedonian place name Βρομίσκος or Βορμίσκος (Thuc. 4. 103): βρόμος 'roaring,' 'that which is situated near the roaring' river at the outlet of a lake. Similarly Δορίσκος (Her. 7. 59): δόρυ, 'that which is situated near the trees,' a Thracian plain with a fortified place, also Ἐργίσκη (Aeschin. 3. 82): ἔργα 'fields,' 'that which is situated near the fields,' a place in Thrace, and Μυρτίσκη[2] (Aeschin. 3. 82): μύρτος, 'that which is situated near the myrtles,' also a place in Thrace. The suffix of the last three words could also be interpreted as 'provided with.'

[1] Cf. Hirt, Die Indogermanen 149; Hoffmann, Die Makedonen 232.

[2] *Μυρτίσκη* may be a deteriorative of *Μυρτηνόν* (Dem. 18. 27). In Aeschines *Μυρτίσκη* would then have been influenced by the neighboring *Ἐργίσκη*.

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Finally there are Γαρίσκος (Ptol. 3. 12. 22; Strabo 7. 330) a Macedonian city: Mac. τὰ γάρρα (?) 'rods,' and Ἀρτισκός (Herod. 4. 92) a tributary to the Helios river in Thrace, which Pape translates 'Riemel,' but which probably also is not a Greek word at all, as can be seen particularly from its accent. The comparative productivity of these words in Macedonia and Thrace was evidently a local peculiarity; probably e. g. the Macedonian language had words of its own like Βερτίσκον,[1] in which the Greeks of those regions recognized their own suffix -ισκο- and formed other really Greek place names like Ἐλευθερίσκος by analogy. By all means, then, the meanings 'belonging to' etc. in these words can not be used for establishing the semantic history of Greek -ισκο-.

98. When we come to the personal names in -ισκο-, we find a rather large productivity—I have found a hundred, mostly in Pape's lexicon and Collitz-Bechtel—a productivity which begins as early as Herodotus and Thucydides. The absence of these names from the Lyric poets is probably accidental, since the suffix occurs repeatedly in appellatives in the same poets, though it may be that their productivity did not become large till the end of the fifth cent. B. C.

99. The large majority of these names show the two principle uses of -ισκο-, that of expressing similarity and the diminutive-hypocoristic use. If there ever were any deterioratives among them, they became hypocoristic by being humorously applied to little children, e. g. Λυκίσκος 'Wolfy' may have contained the notion of reprehensible greediness, but when given to a baby it was used good-humoredly and affectionately. The border line between the diminutives and those words in which the suffix was an exponent of similarity was far from accurate. Since permanent names are usually given shortly after birth, i. e. to very small children, most of the following proper names could sometimes also have been felt as diminutives, e. g. Ἀρνίσκος could be 'little lamb' as well as 'lamb-like.' Since, however, the use of -ισκο- to designate similarity is its oldest use, and as familiar at all times as the 'diminutive' uses, we may assume that these proper names were at least partly felt as showing this meaning, and that the notion of small size was often in the background.

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[1] The variants *Ἀρτησκός* and *Γαρησκός* for *Ἀρτισκός* and *Γαρίσκος* indicate that the suffix was not quite the same as Gr. *-ισκο-*, but was adapted.

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1. -ισκο- expresses Similarity.

100. The name contains some metaphor, which seizes upon some particular quality or qualities common to a person and e. g. an animal or plant. These names were either nick-names, as at Sparta Κυνίσκος 'Doggy' was another name for Ζευξίδαμος (Herod. 6. 71), and could then be given at any time of life, so that the diminutive idea could be totally absent, or oftener they were permanent names from the beginning. The latter must have largely developed from the former,[1] since nick-names have a tendency to become permanently attached to individuals, and later are transferred to other individuals in a conventional way. Thus the above Κυνίσκος is the permanent name of a Lacedaemonian in Xen. An. 7. 1. 13. Wherever a metaphor contains an element of censure, as in Λαγίσκᾱ or Λαγώς 'hare' (because cowardly), we must assume that the word was originally a nick-name and then lost its deteriorative element; for one would hardly give his own child a derogatory name except in a humorous way.

101. The different words may be classified according to the nature of the primitive, i. e. according to the object compared.

A. *The primitive is the name of an animal.*[2] *Ἀρνίσκος*: ἀρνός (gen.) 'lamb.' From Elis in Paus. 6. 16. 7. *Βοΐσκᾱ*: ἡ βοῦς 'cow.' Corinth Anth. P. 7. 493. *Βοΐσκος*: ὁ βοῦς 'ox.' Thessaly Xen. An. 5. 8. 23, CB. 345. 51, 79 (about 214 B. C.); Boeotia CIG. 1570; Epirus CB. 1349. 7. *Κυνίσκᾱ*: ἡ κύων 'bitch.' Sparta Xen. Ag. 9. 6 (a sister of Agesilaos); Sicily Theocr. 14. 8. *Κυνίσκος*: ὁ κύων 'dog.' Sybaris CB. 1653 (as Ϙυνίσϙος); Sparta (§ 100); Mantinea Paus. 6. 14. 11; Smyrna CB. 5616. 42 (about 300 B. C.). *Λαγίσκᾱ*: λαγός 'hare.' Strattis frg. 2. 764 τὴν Λαγίσκαν τὴν Ἰσοκράτους παλλακήν. Also Lys. ap. Ath. 592 E. *Λεοντίσκος*: λέων 'lion.' Acarnania CB. 1389. 15; Cos CB. 3624 c 57 (third or second cent. B. C.); Rhodes CB. 3762. 9; Heraclea CB. 4629. 1. 183 (end of fourth cent.); Messene in Sicily Paus. 6. 2. 10 ff.; Smyrna Mion. 3. 196, 218; Samos Mion. 6. 409; Halicarnassus CB. 5727 a 17 (end of fifth cent. B. C.). *Λυκίσκᾱ*: ἡ λύκος 'wolf.'

[1] Cf. Bechtel, Att. Frauennamen 99.

[2] Animals naturally offer the best field of comparison. The lion's strength, the slenderness of the deer, the fidelity of the dog would e. g. be qualities which would appeal in the giving of a name. Cf. Bechtel, op. cit. 87: "Das weiche Haar, der zarte Flaum, die zierliche Gestalt, die anmutigen Bewegungen kleiner Tiere ergötzen das Auge und schmeicheln der streichelnden Hand — was Wunder, daß man geliebte Wesen aus der menschlichen Gesellschaft mit ihnen verglich."

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Triteae in Phocis CB. 1730. 3 (173–172 B. C.). *Λυκίσκος*: ὁ λύκος 'wolf.' Boeotia CB. 379. 7, 713 a 17; Acarnania CB. 1379. 4; Aetolia CB. 1428 i 4; Epirus CIG. 1802; Cephallania CB. 2566. 68 (227 or 226 B. C.); Delphi CB. 1743. 14, 1767. 8 (170–156 B. C.); Ambrysos CB. 2147. 9 f. (147–100 B. C.); Amphissa CB. 1984. 12 (193–192 B. C.); Tarentum CB. 4626; Messene Paus. 4. 9. 5; Sicily CB. 5221. 1. 2 (Tauromenium), 5244 c (Syracuse); Athens Xen. Hell. 1. 7. 13. *Μυΐσκος*: μῦς 'mouse.' Thasos CIG. 8518. 3. 11; a metic at Calymna CB. 3590. 17; also Anth. P. 12. 59 ff. *Νεβρίσκος*: νεβρός 'fawn.' From an Illyrian island Mion. 3. 338. *Πανθηρίσκος*: πάνθηρ 'panther.' Sparta CIG. 1278. 16. *Παρδαλίσκη*: πάρδαλις 'leopard.' Plautus Casina. *Σαυρίσκος*: σαῦρος 'lizard.' CIG. 4. 6868. *Ταυρίσκος*: ταῦρος 'bull.' Amphissa CB. 2139. 8 (189–188 B. C.); Calymna CB. 3590. 62 (about 205 B. C.); Athens CIG. 126. 24; Cyzicus Plin. 33. 12. 55. 156. *Τραγίσκος*: τράγος 'he-goat.' Tarentum Pol. 8. 29, 30; Crete Plut. Arax. 29. *Φρυνίσκος*: φρύνη 'toad.'[1] Thessaly CB. 326. 3. 32; Boeotia CB. 830; Achaea Xen. An. 7. 2. 1.

B. *The primitive is a plant name.* The point of comparison seems to be slenderness, neatness, and growth. Cf. Bechtel, op. cit. 100. *Ἀμπελίσκη*: ἄμπελος 'vine.' Plaut. Rud. 220 ff. *Καλαμίσκος*: κάλαμος 'reed.' Pisidia CIG. 3. 4366 w 26.

C. *The primitive is the name of a thing.* *Ἀστερίσκος*: ἀστήρ 'star.' Samos CB. 5704. 8 (third or second cent. B. C.). *Εἰρίσκος*: εἶρος 'wool,' 'Wooly.' Metapontium Iambl. v. Pythag. 36. *Μηνίσκος*: μήνη 'moon.' Pisidia CIG. 3. 4367 A 7; also Plut. 2. 348 F. *Μυρίσκος*: μύρον 'ointment.' Athens CIG. 276. 25; Sarmatia ib. 2130. 28, 37 (time of emperor Tiberias). *Φορμίσκος*[2]: φορμός 'basket.' Epirus CB. 1359. 7.

2. -ισκο- with Diminutive-hypocoristic Meaning.

102. Since almost all of these names are permanent names, the diminutive-hypocoristic origin of the category is on the whole rather a matter of inference than of immediate observation. The diminutive meaning is indeed certain for *Ἡρακλίσκος*, which is applied to the infant Heracles as title of a poem of Theocritus, and hypocoristic meaning is probably found in *Σατυρίσκος* as an alternate for Σάτυρος in Mosch. 6. 4, though possibly with a deteriorative shade. Certainly hypocoristic is the Plautine *Lampadis-*

[1] Color seems to be the point of comparison.

[2] Probably conceived of as 'carrier.' Cf. the German name 'Korb' in Freytag's Die Journalisten.

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cus, which is once used for Lampadio Cist. 544 Audire vocem visa sum ante aedis modo Mei Lampadisci servi. Still better Olympio is once affectionately addressed as *Olympiscus* in Plaut. Cas. 739 obsecro te, Olympisce mi, mi pater, mi patrone. We may further surmise that those permanent names in -ισκο- which were derived from other names were diminutives, the child being originally thought of as 'little father' or little mother.' If the father's name was Αἰσχύλος, what was more appropriate than to call the infant son 'little Aeschylus' or Αἰσχυλίσκος? An example of the son's name as a diminutive of the father's is Herond. 2. 76 χὠ πάππος Ἤν μοι Σισυμβρᾶς χὠ πατὴρ Σισυμβρίσκος. In the same way Μενίσκος was son of Μένων in the Thessalian inscription CB. 345. 56, and the Cephallanian Λυκίσκος was son of Λύκος CB. 2564. 61. And again when we read Λέων Λεοντίσκου in an inscription from Acarnania CB. 1389. 15, we may wonder whether according to the custom of naming a baby after its grandfather the father of Leontiscus was not in turn named Leon, whence the son's name 'little Leon.' The fact that a name thus given clings to the person after he grows to the same size as his father accounts for the fading of the diminutive notion. Hypocorism, however, could be connected with the suffix at any time even though the name was a permanent one.

103. The primitive of a diminutive designating a person must of course in every case itself designate a person, but we may subdivide according to whether the primitive designates the person as having a certain occupation or profession, or is a personal appellative of a different kind, or an ethnicon, or is itself a permanent personal name.

A. *The primitive designates a man as belonging to an occupation or profession.* If the father e. g. was a fuller, the baby could be named 'little fuller.' *Γναφίσκος*: γναφεύς 'fuller.' Insc. *Δρομίσκος*: δρομεύς 'runner.' Thessaly CB. 326. 3. 15; Attica Ephem. Arch. 2. n. 1898. K. *Ἰανίσκος*: *ἰανεύς 'physician' (cf. ἰαίνω [1] 'to heal.)' Son of Asclepius Schol. Ar. Plut. 701; king of Sicyon Paus. 2. 6. 6. *Κυβερνίσκος*[2]: κυβερνήτης 'pilot.' A Lycian Herod. 7. 98.

B. *The primitive is a personal appellative of a different kind.* The reasons for the diminutives are self-explanatory: a child could

[1] Certainly not by syncope from *Ἰασανίσκος*, as Janson, op. cit. 6. The son of Asclepius has to do with healing.

[2] The form is puzzling. Either *Κυβερνίσκος* is to be compared with *τριμίσκος* (§ 12) instead of **τριμιτίσκος*, or the primitive is really *κύβερνος* (Greg. Naz.), whose late appearance would then be accidental.

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be called 'little king' if son of a king,[1] or 'little father,' 'little boy,' 'little man,' etc. *Ἀνδρίσκος* : ἀνήρ 'man.' Telos CB. 3488 c 4; Sicily CB. 5219. 1. 46, 203, 246 (Tauromenium); Athens CIG. 168 b; Naxos Ath. 78 C; a Macedonian king Paus. 7. 13. 1. *Ἀνθρωπίσκος* : ἄνθρωπος 'man'. Tarentum CB. 4616. 2. 10 (end of fourth or third cent. B. C.). *Βασιλίσκος* : βασιλεύς 'king.' Suid.; Anth. P. 1. 11 (Christian period). *Ἡρωΐσκος* : ἥρως 'hero.' Attica A. Rangab. 2. n. 1384. *Κορίσκος* : κόρος 'youth.' Skepsis Plato Ep. 6. 323 A; also Strabo 608; Alciphr. 3. 33. *Ματερίσκᾱ* : μάτηρ 'mother.' CIG. 4. 6913. 2 f. *Νανίσκος* : νᾶνος 'fellow.' On Samian coins Mion. 3. 284. *Παιδίσκη* 'Girlie': ἡ παῖς. Attica CIA. 2. 3. 4051. *Παπίσκος* : πάπας 'papa.' Schol. Dionys. de myst. theol. 1. 1. *Πατρίσκος* : πατήρ 'father.' On a coin from Priene Mion. 3. 187. *Φιλίσκος* : φίλος 'friend.' Thessaly CB. 345. 81 (about 214 B. C.); Boeotia CB. 2563. 51 (272 B. C.); Thelpusa in Arcadia CB. 2628. 1 (230–220 B. C.); Phthiotis CB. 1461. 1. 60; Delphi CB. 1963. 10 (182 B. C.); Corcyra Ath. 198 B, C; Aegina Diog. Laert. 6. 2. n. 7, 10, 12; Cos CB. 3706. 7. 14, 8. 66, 69 (end of third cent. B. C.); Rhodes CB. 3791. 490 (ab. 70 B. C.), 306. 2; Carpathus CB. 4322 a 14, 20 (beginning of second cent. B. C.); Tarentum CB. 4626 (300–272 B. C.); Messene CB. 2566. 12 (227 or 226 B. C.); Cyrene CB. 4846. 4 (68 or 73 A. D.); Sicily CB. 5219. 1. 58 (Tauromenium), 5244 a (Syracuse); an Athenian poet of the Middle Comedy ap. Suid.; Eretria CB. 5312. 23 (308–304 B. C.); Thasos CB. 5478 b 9 f., 5484. 10; Tenos CB. 5492. 58; Erythrae CB. 5692 a 16 (soon after 278 B. C.); Miletus Hes. s. v.; Abydus Xen. Hell. 7. 1. 27.

C. *The primitive is an ethnicon.* Some of these were doubtless nicknames given in later life, e. g. a slave from Syria might be called Συρίσκος in preference to his real name, which would be unfamiliar to Greek ears. *Εὐβοΐσκος* : Εὐβοεύς 'Euboean.' Chaeronea IGS. 1. 3391. 6 μετ' Εὐβοΐσκον ἄρχει. *Θετταλίσκος* : Θετταλός 'Thessalian.' Thebes Arist. Rhet. 2. 23. 1398 b 4. *Συρίσκᾱ* : Σύρα 'Syrian.' Thessalonica CIG. 2. 1982. *Συρίσκος* : Σύρος 'Syrian.' Megar. Chersonesus CB. 3086. 11 (third or second cent. B. C.); a slave name Anaxipp. frg. 4. 466 and Ter. Eun. 772. Another Syrian Tzetzes Hist. 9. 503, 505. *Φραγκίσκος* : Φράγκος 'Frank.' Anon. de fig. in Rhet. Graec. ed. Spengel t. 3 p. 172.

D. *The primitive is itself a permanent personal name,* e. g. Ἀφελίσκος 'a little Apheles.' *Αἰσχυλίσκος* : Αἰσχύλος. Corcyra CIG. 1852. *Ἁλίσκος* : Ἁλεός. Hes. *Ἀρτεμίσκος* : Ἀρτεμᾶς Ἀρτέμων. Sic-

[1] Possibly with the notion of similarity: "a royal boy."

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ily (Centoripa) CB. 5248. 4 [Ἀρ](τ)εμίσκος. *Ἀσφαλίσκος* : Ἀσφάλης Ἀσφάλεος.[1] Eretria CB. 5313. 158 (third cent. B. C.). *Αὐλίσκος* : Αὖλος. Paus. 2. 31. 6. *Ἀφελίσκος* : Ἀφέλης. Boeotia CB. 429. 7. *Γοργονίσκᾱ* : Γοργών. Thessaly (Larissa) CB. 356. 2. *Δαΐσκος* : Δᾶος. Phalar. Ep. 31. *Δᾱμίσκος* : Δᾶμις.[2] Messene Paus. 6. 2. 10. *Ἑρμαΐσκος* : Ἑρμαῖος. Boeotia CB. 586; Attica CIG. 180. 11; Alex. frg. 3. 433 (4). *Εὐφανίσκος* : Εὐφάνης. Rhodes CB. 3758. 1, 3789. 2 (second cent. B. C.), etc. *Εὐφρανίσκος*[3] : Εὐφρανίας (Suid.). Rhodes CB. 3778. 4. *Εὐφρονίσκος* : Εὔφρων. Boeotia CB. 553. 25. *Ζωπυρίσκος* : Ζώπυρος. Heraclea CB. 4629. 1. 97 (end of fourth cent. B. C.); Tauromenium in Sicily CB. 5219. 1. 66, 121. *Ἡραΐσκος* : Ἡραῖος. Egypt Isid. 107, 112, Suid. *Θεοφιλίσκος* : Θεόφιλος. Rhodes Pol. 16. 2–9. *Ἰαμίσκος*[4] : Ἴαμος. Boeotia CB. 468. *Κολλυβίσκος* : Κολλύβας (Smyrna Mion. 3. 217). Plaut. Poen. *Κρατίσκος* : Κράτης. Tarentum CB. 4616. 2. 5 (end of fourth or third cent. B. C.). *Λαμίσκη* : Λάμια. Samos Diosc. 7. 166. *Λαμίσκος* : Λαμίας Λάμιος. Boeotia Keil Insc. Boeot. 44 b; Epirus CB. 1353. 5; Acarnania CB. 1389. 11; Argos Amphil. CB. 2530. 5 (230–200 B. C.); Corcyra CB. 3207. 4, 10; doubtful for Crete CB. 4944. 8; Samos Plato Ep. 7. 350 B. *Λαμπρίσκος* : Λάμπρος. Herondas 3. 57 ff. *Λεπτινίσκος* : Λεπτίνης. Antiphan. ap. Ath. 641 F. *Λυβίσκος* : Λύβᾱς (Suid.). Thessaly (Phthiotis) CB. 1461. 1. 38. *Λυρανίσκος* : Λυρανίας = Λυσανίας. Eretria CB. 5331. *Μενίσκος* : Μένης Μένων. Thessaly CB. 345. 56 (about 214 B. C.); Boeotia CB. 749; Delphi CB. 1931. 5 (about 100 B. C.); Calchedon CB. 3054. 10; Sicily CB. 5720. 2. 74; Athens Plut. 2. 747 B; on Dyrrachian and Phrygian coins Mion. 2. 41, 4. 300. *Μυνισκος*[5] : Μύνης. Chalcis Plato Com. frg. 2. 668 (3). *Πανίσκος* : Πάν. Egypt Pap. Taur. 1. 1. 7, CIG. 3. 4893. 27, 4969. *Πανταλίσκος* : Πανταλέων (Tenos CB. 5492. 95). Thasos CB. 5473 b 10 (fourth cent. B. C.). *Παρμ(εν)ίσκος*[6] : Παρμένων Παρμένιος. Thessaly CB. 326. 1. 13, 345. 50 (about 214 B. C.); Boeotia CB. 485. 26 (223–197 B. C.); Calymna CB. 3567. 3; Cos CB. 3706. 3. 54 ff. etc. (end of third cent. B. C.);

[1] Occurs in the same inscription as the diminutive.

[2] *Δᾱμις* rather than *Δαμίας* or *Δάμιος* is the primitive because it occurs in the Doric inscriptions, particularly in Messene, from which the name *Δᾱμίσκος* came.

[3] Cf Bechtel, BB. 21. 228.

[4] Some would read *Δαμίσκος*.

[5] Spelled *Μυννίσκος* in the passage cited. With one *ν* Arist. Poet. 26. 1461 b 36.

[6] The form *Παρμίσκος* is found Iambl. v. Pyth. 267. Cf. § 105.

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Rhodes CB. 3791. 415 (about 70 B. C.); Corcyra CIG. 2. 1881; Athens Dem. 56. 5; Samothrace CIG. 2157; Erythrae CB. 5692 c 35 (third cent. B. C.); Byzantium CB. 705. 25; a Metapontinan philosopher Ath. 614 A. *Παταικίσκος*: Παταίκιος Παταικίων. Herond. 4. 63. *Ποδίσκος*: Ποδῆς (Il. 17. 575). Insc. ap. Aschick Bosporanisches Reich 1. *Ποθίσκος*: Πόθος. Sarmatia CIG. 2. 2130. 64. *Σατυρίσκος*: Σάτυρος. Probably a slave-name from Thera CB. 4699. 14 (end of third cent. B. C.) Σατ]υρίσκον. *Σιμίσκος*: Σῖμος -ων. Sicily (Tauromenium) IGSI. 421. Ia 1. *Σισυμβρίσκος*: Σισυμβρᾶς. Herond. 2. 76. *Σοφοκλιδίσκη*: Σοφοκλίς. Plaut. Pers. *Σωφρονίσκος*: Σώφρων. Calymna CB. 3590. 27; Athens Plato Euthydem. 297 E. *Τελίσκος*: Τέλης. Thuria CB. 4679. 6 (third or second cent. B. C.). *Φανίσκος*: Φάνος. Plaut. Most. *Φρονίσκος*[1]: Φρόνιος (Od. 2. 386, 4. 648). Boeotia CB. 476. 45.

E. To the words of D should doubtless be added a number of names which can not be referred to any actually existing primitive, but which nevertheless have the appearance of being derived from other names. Leaving out of account *Λεοντίσκος* (Insc. Hypat. n. 195 b, Curt. Insc. Att. 12, p. 32), which Keil plausibly explains as a mistake for Λεοντίσκος, there is *Ὀλτίσκος* (Abacaenum in Sicily CB. 5208), *Ῥυΐσκος* (Boeotia CB. 707. 2), and *Πολυβαδίσκος* (Plaut. ap. Varro L. L. 6. 73). Though the exact forms of the primitives can not be determined, they must have been something like *Ολτίας, *Ῥύϊος, and *Πολυβάδης.

F. Some of words classified above as derived from appellatives may in reality also belong to D if the same primitive is in use as a proper name, or at least one so like it as to have the same basis of derivation. Thus the names Λεοντίσκος, Λυκίσκος, Σαυρίσκος, Φρυνίσκος, and Φορμίσκος, instead of being 'like a lion, wolf, lizard, toad, and basket' respectively (§ 101), could have been derived from the proper names Λέων, Λύκος (§ 102), Σαυρίας, Φρῦνος or Φρυνίων, Φόρμος or Φόρμις or Φορμίων. Similarly Δρομίσκος and Κυβερνίσκος (A), instead of being 'little runner' and 'little pilot,' could have come from Δρομεύς and Κυβερνήτης; Νανίσκος and Παπίσκος (B), instead of being 'little fellow' and 'little papa,' could be referred to the proper names Νᾶνος and Πάπας or Παππᾶς or Παπίας. Since we have no idea when and how these words were first formed no certain decision for the individual word could be reached.

[1] That a child should be given the diminutive of a Homeric name is perfectly intelligible. It is not necessary, therefore, to assume that *Φρονίσκος* stands for *Εὐ]φρονίσκος*, as Keil supposes.

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104. Feminines in -ισκη are sometimes formed as a counterpart to a previously existing masculine in -ισκος, without being directly traceable to a feminine name as primitive. So *Ἀλίσκη* [1] (Plaut. Cist.) is probably patterned after the masculine Ἀλίσκος : Ἀλεός ; *Μενίσκη* (Cos CB. 3706. 1. 18, 3. 63, 7. 36) after Μενίσκος : Μένης or Μένων ; *Εὐφρονίσκᾱ* (Lipara CB. 3552) after Εὐφρονίσκος: Εὔφρων; possibly also *Λαμίσκη* after Λαμίσκος instead of : ἡ Λάμια, *Βοΐσκᾱ* after Βοΐσκος instead of : ἡ βοῦς, etc.

105. As a successor to I. E. -ko- -ισκο- could probably take upon itself the function of forming " Kosenamen," i. e. shortened forms of compound proper names of which only one member, usually the first, was used in full, whereas the other was suppressed entirely or nearly so. Even if this function was not due to syncretism with prehistoric -ko- or -lo-, it could easily develop in the Greek language itself by a shift of grouping of etymologically related names. Thus Δαμίσκος, which was a diminutive of Δᾶμις or Δαμίας, could be referred to the compound Δαμοκράτης or Δαμόκριτος or Δαμοκλῆς, particularly since Δᾶμις and Δαμίας were themselves " Kosenamen " of these same compounds. Similarly Λαμπρίσκος might be " Kosename " of Λαμπρόμαχος or Λαμπροκλῆς instead of being a diminutive of Λάμπρος, Μενίσκος e. g. of Μενέξενος -λαος instead of : Μένης Μένων, Ποδίσκος of Ποδάνεμος Ποδάρκης instead of : Ποδῆς, Φανίσκος of Φάνιππος instead of : Φάνος -ίας. Also a number of words listed above as coming from appellatives might have been formed or secondarily felt as " Kosenamen," e. g. Ἀνδρίσκος [2] of Ἀνδροκράτης etc. instead of being ' little man,' Δρομίσκος of Δρομοκλῆς -κλείδης instead of ' little runner,' Λυκίσκος of Λυκοῦργος etc. instead of ' Wolfy,' Μηνίσκος of Μηνόδοτος -δωρος instead of : μήνη ' moon,' Πατρίσκος of Πατροκλῆς etc. instead of being ' little father,' Φιλίσκος of Φίλιππος Φιλοκράτης instead of ' little friend.' Since a number of names from similar or identical stems usually existed alongside of each other we can not, however, often tell whether an individual word was a " Kosename " or not. But that -ισκο- was at least occasionally used in their formation is shown by several words in which the addition of the suffix is accompanied by such mutilation of the stem of the primitives that it can not possibly be explained by the rules of sandhi (cf. § 12). These are Πανταλίσκος : Πανταλέων and Παρμίσκος : Παρμένων (§ 103 D). Directly formed from a compound stem is also the Boeotian *Ἰρανί-*

[1] For the inorganic h of the Latin form Halisca cf. Stolz, Lat. Gram.[4] 128; Sommer, Handb. d. lat. Laut- u. Formenl. 217.

[2] This word e. g. is considered a " Kosename " by Fick-Bechtel.

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σκος (CB. 708), which can not come from Εἰρηναῖος, which would have given *'Ιραναΐσκος (cf. § 12 third note), but must be "Kosename" of some word like Εἰρήνιππος.

3. Apparent cases of other meanings of -ισκο-.

106. Other apparent meanings of -ισκο- than that of expressing similarity and the 'diminutive' meanings are still rarer in proper names than in appellatives (§ 85 ff.), and may with great probability be denied altogether. It would indeed be possible to assume that Λαμίσκος and Λαμίσκη were conceived as 'he (or she) who has a (large) gullet (λάμος),' instead of being derived from Λάμιος Λαμίας and Λάμια, or that Ποδίσκος was 'he who has (big) feet' instead of a diminutive of Ποδῆς, were it not for the fact that there are no proper names where the assumption of the possessive meaning of our suffix is a necessary one. In the same way we might assume that the meaning of appurtenance was present in Κολλυβίσκος, the name of a steward, as 'he who has to do with the coin (κόλλυβος),' instead of being a diminutive of the proper name Κολλύβας, and that the Boeotian 'Ιρανίσκος meant 'belonging to peace (εἰρήνη)' rather than that it was a "Kosename" of 'Ιράνιππος, were it not that the overwhelming preponderance of diminutives should make us classify the ambiguous examples as probably belonging there. There are indeed a few words where appurtenance seems at first sight the necessary meaning of the suffix: *'Αγρίσκᾱ* (Lycophr. 1152) : ἀγρός,[1] 'she who belongs to the fields,' an epithet of the goddess Athena; *Μελίσκος* (Anth. P. 6. 82) : μέλος, 'he who is concerned with the melody,' the name of a fluteblower; *Ταπίσκος* (Nil. Ep. 3. 75) 'he who belongs either to the town Τάπαι or Τάπη'; *'Εργίσκος* (Harp. s. v. 'Εργίσκη) : τὰ ἔργα, perhaps 'he who is concerned with the fields.' For the last-mentioned, however, it is clear that the person designated is a mere hero eponymous, and that his name is therefore a retrograde derivative of the name of the town 'Εργίσκη, which he was reputed to have founded. As to the other three, their isolated position would incline me to the view that they come from names which are accidentally not quotable,[2] e. g. *'Αγρία or *Τάπιος. On the other hand it is conceivable that the suffix secondarily de-

[1] If *'Αγρίσκα* were an old word it might have come from the adjective *ἄγριος*. Cf. § 10.

[2] Perhaps *Μελίσκος* was derived from *Μέλων* or *Μέλιος* (: *μέλω* 'to be a care to'), and was secondarily connected with *μέλος*.

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veloped the notion of appurtenance in some way like the following. Κολλυβίσκος, though derived from the proper name Κολλύβας, the name of a steward, might be referred to the appellative κόλλυβος 'small coin' as 'he who has to do with the coin,' and other words might follow by analogy.

107. One name in -ισκο- seems to de derived from an adjective primitive: *Ἑβδομίσκος* (Andros CIG. 2. 2349 c 3 add.): ἕβδομος 'seventh.' If so, it followed the analogy of names like Ἀφελίσκος, Εὐφρονίσκος, Λαμπρίσκος, and Σωφρονίσκος, which, though derived from the proper names Ἀφέλης, Εὔφρων, Λάμπρος, and Σώφρων, could as well be referred to the adjectives ἀφέλης, εὔφρων, λαμπρός, and σώφρων respectively. Since, however, Ἑβδομίσκος would thus stand altogether alone among proper names as to its derivation, and since there is only one appellative which with any degree of probability is derived from an adjective (§ 28), it is more probable that the primitive adjective was itself used as a proper name which happens not to have been transmitted.

108. I have necessarily ignored altogether a number of names in -ισκο- of non-Greek origin, since these have no value for Greek semantics. Such are the Persian *Ὀρίσκος* (Ctes. 40 b 3) and *Παρίσκας* (Plut. Artox. 12), and *Σκορδίσκος* (App. Illyr. 2), the son of Paeon after whom the Keltic Σκορδίσκοι are said to have been named.

IX. THE DIALECTIC DISTRIBUTION OF WORDS IN *-ΙΣΚΟ-*.

109. For a detailed dialectic history of the suffix there is insufficient material. The appellatives are of such sporadic occurrence in the dialect inscriptions that almost nothing can be made of them, and the proper names, while fairly numerous on the whole, yet yield such a small number for the dialect of each locality that negative evidence, to say the least, is precarious. The principal conclusion we can draw from the distribution of these comparatively few forms over most of the dialects is that, with the exception of the Aeolic (§ 1), probably every Greek dialect knew them, and that the pre-Hellenic origin of the suffix is thus again confirmed (§ 2). There are indeed other dialects than the Aeolic in which -ισκο- has not been found in inscriptions, but the evidence is insufficient to make actual absence of the suffix even probable. That I have found no names of persons in -ισκο- from Aeniania, Cyprus, and Pamphilia is explained by the scarcity of inscriptions from these regions as well as from the comparatively

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small amount of contact of their people with the rest of Greece, a fact which accounts for their being rarely mentioned in Greek literature, and for the consequent rarity of all kinds of names of persons from those localities. I have also found no inscriptional evidence of names in -ισκο- from Crete and Achaea, but the occurrence in literature of one such name from Crete and another from Achaea shows that their absence from inscriptions is accidental. That the comparatively large amount of material from Crete should not have yielded even one certain name in -ισκο- is due to the nature of the inscriptions—they are largely of legal contents and do not contain long lists of proper names like e. g. the Thessalian inscription CB. 345.

110. It is self-evident that certain names in -ισκο-, like other names also, were peculiar to or at least particularly popular in certain localities. Thus Παρμενίσκος, while common to many different dialects, was particularly favored at Cos, where it occurs twenty times in inscriptions. When moreover Εὐφανίσκος occurs in five different Rhodian inscriptions, and once at Delphi (CB. 2581. 218), but there the name of a Rhodian, we can be certain that it was a purely Rhodian name. Similarly the fact that Μενίσκη is the name of three different individuals at Cos, but is not found anywhere else, makes it probable that is was confined to Cos. Also some of the ἅπαξ λεγόμενα were no doubt actually limited to the places where they are found, but it is unsafe to draw conclusions in the individual case.

111. In the want, then, of sufficient evidence to trace the history of the suffix in the dialects, I shall give a table of the words actually found, making no distinction whether a person designated as coming from a certain locality is mentioned in an inscription from the same or a different locality or in literature—what is important is merely the place from which the person's name came. These names will merely be mentioned—for details consult the references in the index—under the heading of the larger geographical units to which they belong, e. g. they are classified merely as Boeotian instead of Theban, Thespian, etc.

I. *Arcado-Cyprian.* A) Arcadian : Φιλίσκος. B) Cyprian : none.

II. *North-east Greek.* A) Aeolian : none. B) Thessalian : Βοΐσκος, Γοργονίσκᾱ, Δρομίσκος, Μενίσκος, Παρμενίσκος, Φιλίσκος, Φρυνίσκος. C) Boeotian : Ἀφελίσκος, Βοΐσκος, Ἑρμαΐσκος, Εὐβοΐσκος, Εὐφρονίσκος, Θετταλίσκος, Ἰαμίσκος, Λαμίσκος, Λυκίσκος, Μενίσκος, Παρμενίσκος, Ῥυΐσκος, Φιλίσκος, Φρονίσκος, Φρυνίσκος.

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III. *North-west Greek.* A) Group I. 1) Epirus : Βοΐσκος, Λαμίσκος, Λυκίσκος, Φορμίσκος. 2) Acarnania : Λαμίσκος, Λεοντίσκος, Λυκίσκος, 3) Aetolia : Λυκίσκος. 4) Phthiotis : Λυβίσκος, Φιλίσκος. 5) Cephallania : Λυκίσκος. B) Group II. 1) Locris : Λυκίσκος, Ταυρίσκος. 2) Phocis : Λυκίσκᾱ, Λυκίσκος, Μενίσκος, Φιλίσκος. 3) Achaea and its colonies : Ϙυνίσϙος (Sybaris), Φρυνίσκος (Achaea). D) Elean : Ἀρνίσκος.

IV. *Doric.* A) Laconian and Heraclean. 1) Laconia : Κυνίσκᾱ, Κυνίσκος, Πανθηρίσκος. 2) Tarentum : Ἀνθρωπίσκος, Κρατίσκος, Τραγίσκος, Φιλίσκος. 3) Heraclea : Ζωπυρίσκος, Λεοντίσκος. B) Messenian : Δᾱμίσκος, Κυνίσκος, Λυκίσκος, Τελίσκος (Thuria). C) Megarian : Μενίσκος (Calchedon), Παρμενίσκος (Byzantium), Συρίσκος (Chersonesus). D) Corinthian. 1) Corinth : Βοΐσκᾱ. 2) Sicyon : Ἰανίσκος. 3) Corcyra : Αἰσχυλίσκος, Λαμίσκος, Παρμενίσκος, Φιλίσκος. E) Argolic. 1) Argos : none. 2) Aegina : Φιλίσκος. F) Rhodian. 1) Rhodes : Εὐφανίσκος, Εὐφρανίσκος, Θεοφιλίσκος, Λεοντίσκος, Παρμενίσκος, Φιλίσκος. 2) Carpathus : Φιλίσκος. 3) Telos : Ἀνδρίσκος. G) Coan and Calymnian. 1) Cos : Λεοντίσκος, Μενίσκη, Παρμενίσκος, Φιλίσκος. 2) Calymna : Παρμενίσκος, Σωφρονίσκος, Ταυρίσκος. H) The dialect of Cnidus etc. : Εὐφρονίσκᾱ (Lipara). I) Theran and Melian : Φιλίσκος (Cyrene). J) Cretan : Λαμίσκος (?), Τραγίσκος. K) The Dorian dialects of Sicily : Ἀνδρίσκος, Ἀρτεμίσκος, Ζωπυρίσκος, Λεοντίσκος, Λυκίσκος, Ὀλτίσκος, Φιλίσκος.

V. *Ionic.* A) East Ionic. 1) Smyrna : Κυνίσκος, Λεοντίσκος. 2) Erythrae : Παρμενίσκος, Φιλίσκος. 3) Priene : Πατρίσκος. 4) Miletus : Φιλίσκος. 5) Halicarnassus : Λεοντίσκος. 6) Samos ; Ἀστερίσκος, Λαμίσκη, Λεοντίσκος, Νανίσκος. 7) Samothrace : Παρμενίσκος. 8) Cyzicus : Ταυρίσκος. 9) Abydus : Φιλίσκος. B) The dialect of the Cyclades. 1) Tenos : Φιλίσκος. 2) Naxos : Ἀνδρίσκος. 3) Thasos : Μυΐσκος, Πανταλίσκος, Φιλίσκος. C) Euboean : Ἀσφαλίσκος, Λυρανίσκος, Μυν(ν)ίσκος, Φιλίσκος.

X. *-ΙΣΚΟ-* IN CONGLUTINATES.

112. There are none with -ισκο- as last component except -αλίσκος, in ποσθαλίσκος : πόσθων, which is explained § 61 as patterned after κωραλίσκος : κωράλιον.

113. With -ισκο- as first component we find a number of conglutinates in -ιον and its compounds. The only one which has

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any productivity is -ισκιον, for which cf. Gr. Dims. in -ιον 251 ff.[1] One can hardly say that a conglutinate -ισκάριον is to be abstracted from νεανισκάριον or παιδισκάριον, or -ισκύδριον from νεανισκύδριον, which are rather simple diminutives in -άριον and -ύδριον from non-diminutives and faded diminutives in -ισκο-. -ισκίδιον, however, occurs in *Stephaniscidium*, which is used as a hypocorism for Stephanium in Plaut. Stich. 740: te expetimus, Stephaniscidium, mel meum. Whether there was an intermediate *Στεφανίσκη, or whether -ισκίδιον is an actual conglutinate, and if so, whence it originated, we cannot decide from the material on hand.

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[1] To the words there given should be added two more without an intermediate form in *-ισκο-*: *γυναικίσκιον* (Hes.) 'a little or young woman or girl': *γυνή* 'woman'; *ἐλεφαντίσκιον* (Ael. H. A. 8. 27) 'a little elephant': *ἐλέφας*. Also two more with forms in *-ισκο-*: *παιδίσκιον* (Hes.) 'a little girl': *παιδίσκη*; *τριποδίσκιον* (= *ἀνθράκιον*) AB. 404. 19 (: *τριποδίσκος*), in which *-ιον* is an exponent of similarity.

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New England Spiders

Identified since 1910

BY

J. H. EMERTON

YALE UNIVERSITY PRESS
NEW HAVEN, CONNECTICUT
1913

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New England Spiders identified since 1910

by J. H. Emerton.

The following paper is a continuation of those published at various times in these Transactions and mentions 23 species of spiders found or identified since the printing of my "New Spiders from New England" in Trans. Conn. Acad. June 1911, eighteen of which are new. Twelve of these are described from only one or two specimens some of which have been a long time undescribed in my collection. Among the others Epeira Emertoni, Glyptocranium cornigerum and Lycosa funerea are well known a little farther south and Cercidia prominens is a European species previously noted from Franconia by N. Banks. Ent. News, 1894. Among the new species Lophocarenum bicarinatum has a peculiar form of the head and L. coriaceum has an unusual development of the hard parts of the abdomen. Bathyphantes furcatus is a very distinct species from the Sandwich Mountains and B. duplicatus from Mt. Katahdin is the nearest relative to the little known B. subalpina Em. Trans. Conn. Accad. 1882. Ulesanis serrata is described from an imperfect specimen and its relations are uncertain as are those of Areoncus littoralis and Dipoena pallida.

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Theridium maxillare. new

3 mm. long. Cephalothorax and legs pale yellow, the abdomen whiter than in the other species of Theridium. The cephalothorax has three narrow longitudinal black lines. The abdomen has a wide white stripe in the middle, deeply notched at the sides and not, as in most species, narrowed toward the front. The white area is broken by translucent lines following in the middle the line of the dorsal circulating vessel. The crenate edge of this area is marked by a dark line made up of black spots of irregular size which extend down the sides of the abdomen with one larger spot to each lobe of the middle stripe. The legs are faintly ringed with brown at the end of each joint and in the middle of tibia and metatarsus. The sternum is pale in the middle and brown behind and at the sides. The labium is also brown. The base of the maxillae extends sidewise as a blunt tooth under the coxa of the first leg. The palpal organ has the basal process large and sickle-shaped, with a sharp point extending outward and forward nearly to the end of the palpus. The tube crosses obliquely under the basal process and is supported at the end by a short but complicated appendage. Figs. 1 & 1c. Pl. I.

One male only from low bushes in the large sphagnum bog at Southwest Harbor, Mt. Desert, Me., July 1, 1909.

Theridium cinereum. new

This species is represented by one male only from Wellesley, Mass. It resembles in size and proportions *T. murarium*. As in that species, the front legs are moderately long, not as long as in *montanum* and *sexpunctatum*. The markings are different from the other species. The cephalothorax is pale, with a small dark marking in the middle, widened toward the front but not extending as far as the eyes. At the sides the cephalothorax is edged with dark. The abdomen is dark gray with the middle band broken into four pairs of whitish curved marks, almost separated from each other. On the under side the sternum is pale, without markings, and the abdomen is pale, with gray spots around the spinnerets and the lung openings. The legs are pale, without rings or spots, and only slightly darker toward the tips and toward the ends of the joints. The male palpi are short

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and resemble most nearly those of *T. murarium*. There is a conspicuous dark spine near the outer and upper edge of the tarsus, and the tube is partly hidden between this and a soft pale appendage in the middle of the palpal organ. Figs. 2, 2a, 2b. Pl. I.

Dipoena buccalis, Keyserling, Spinn. Americas, 1886.
Dipoena buccalis, Banks, Nearctic Spiders, 1910.

An immature female is 2 mm. long with the abdomen nearly spherical and the cephalothorax as high as it is wide, highest just beyond the eyes. In front, the head is concave so that the front middle eyes, which are much the largest, project forward. The cephalothorax is gray, lighter in the middle of the head. The abdomen is pale, marked with gray in a narrow middle stripe and several pairs of transverse spots. The sternum is gray and the under side of the abdomen pale. The legs have the coxa and base of femur pale and the end of femur and patella dark gray; there is also a gray spot on the end of the tibia and less distinctly on the end of the metatarsus.

New Haven, Conn. Figs. 3, 3b. Pl. I.

Dipoena pallida. new

2 mm. long. Pale with a faint gray middle line on the cephalothorax and gray spots in three rows on the front half of the abdomen. The height of the head is half the length of the cephalothorax. The front middle eyes extend their diameter in front of the head and are one-half larger than the upper middle eyes. The sternum is as wide as long, and rounded behind. The legs are of moderate length, the first pair only a little longer than the fourth. The male palpi are short, and the palpal organ small and simple. Figs. 4b, 4c. Pl. I.

One male only from Buttonwoods, near Providence, R. I.

Ulesanis serrata. new

1.5 mm. long, light yellow brown without markings. The abdomen with a hard spot that covers the upper surface and hard pieces around the pedicel and around the spinnerets as in several *Ceratinella*. The head is much elongated forward, carrying the front middle eyes which are of the same size as the upper middle pair. The cephalothorax is high, but the head is not much elevated. The sternum is as wide as long, and behind, between the fourth coxae, it is half as wide as at the widest part. The maxillae are wide at the base and narrow toward the points. The palpi are broken off apparently before the spider was caught. The first legs are a little thicker than the others

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and have on the under side of the femur a single row of small spines, eight on one side and nine on the other. Figs. 5, 5a, 5b. Pl. I.

A single male with the palpi broken off, from New Haven, Conn.

Areoncus littoralis. new

1.5 mm. long, pale and dull in color, without markings except a trace of transverse light spots on the gray of the abdomen. The cephalothorax is wide in front and the head is slightly elevated and extended forward in a rounded point beyond the mandibles. The eyes are spread wide apart, the lateral pairs nearly to the sides of the head. The upper middle eyes are their diameter apart. The front middle pair are the smallest and almost touch each other on the front of the head. Below the eyes the front of the head is covered with scattered hairs that turn upward. The male palpi are short, the tarsus rounded and the tibia widened a little at the end with only a short flat tooth on the upper side. Figs. 6, 6a, 6b. Pl. I.

Lyme, Conn., Oct. 8, in straw on the edge of the salt marsh.

Lophocarenum hartlandianum. new

1.5 mm. long, pale brown, the males generally darker than females. Head of male slightly elevated with grooves at the sides distinctly marked by black lines. Just behind the eyes are pits extending inward from the grooves and distinctly visible through the skin as dark markings. The dark lines over the grooves extend forward and unite with black spots behind the lateral pairs of eyes. The male palpi are large and conspicuous, the tibia is twice as long as the patella and is widened at the end where it extends over the tarsus. On the upper side toward the outer corner are two teeth, the inner one recurved and sharp. The tarsus is folded over in a sharp ridge and is narrowed toward the end as seen from above Fig. 7a. The tube of the palpal organ is long and slender, and makes two turns under the tarsus, resting against the ridge on the upper side of the tarsus with the tip between the two teeth on the tibia. Fig. 7. Pl. I.

The female has no peculiar markings. The epigynum shows a distinct middle lobe with the spermathecae showing through the skin at each side of it.

Hartland, Vt. under dead leaves in moist ground, July, 1911. Three Mile Island, Lake Winnepesaukee, N. H., May, 1911.

Lophocarenum bicarinatum. new

1.5 mm. long, dark gray. The head of the male is wide and slightly

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elevated, the highest part being just behind the eyes. Halfway between the lateral and middle eyes are two ridges that converge a little backward and extend nearly the whole length of the head and in front curve downward toward the lateral eyes. Between the upper middle eyes and these ridges are hairs in a single row turning outward. The front of the head below the eyes is rounded and projects only slightly beyond the front middle eyes. If the head is turned down the projection below the eyes disappears and the rows of hairs at the sides of the upper middle eyes become more distinct.

The malepalpi have the tibia the same length as the patella, a little widened at the end, with a pointed process on the upper side slightly curved downward at the tip. The parts of the palpal organ are small and simple. Figs. 8, 8 a. Pl. I.

Two males only under leaves in the woods on Mt. Whiteface, N. H., Aug. 9, 1911.

Lophocarenum sylvaticum. new

2 mm. long, light brown, the legs paler and brighter yellow. In the male there is a well-defined hump on top of the head, carrying the upper middle eyes, and with a deep groove on each side as in the head of *L. cuneatum*. The front of the head below the eyes extends forward in a blunt point beyond the mandibles. The male palpi have the tibia widened at the end and extending in a blunt point over the tarsus.

The female is the same size and color as the male. The epigynum has the usual middle lobe and the spermathecae show through the skin each side of it. Figs. 9, 9 a, 9 b. Pl. I.

Several males and females from under leaves on Mt. Whiteface, N. H., Aug. 9, 1911.

Lophocarenum coriaceum. new

2 mm. long, dark brown, the legs and palpi a little lighter. The cephalothorax is widest behind and narrows forward with the head and eye area smaller than usual. The abruptly elevated hump carrying the upper middle eyes is narrowed toward the front as in *L. crenatum* and the front of the head is more nearly vertical than in most species. Fig. 10 a. Pl. I. The lower part of the face belowthe eyes extends forward over the mandibles. The male palpi are short and small. The tibia extends forward in a wide lobe over the tarsus somewhat as in *crenatum* and *latum*. Fig. 10 b. The abdomen has an oval hard plate that half covers the dorsal surface. Another hard

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plate covers the ventral side and extends far enough to be seen from above on the sides and in front. Fig. 10. These hard plates are rough and covered like the softer areas with fine scattered hairs. The sternum is hard and rough and extends upward between the legs as it does in *L. crenatum.*

One male only from Danbury, Conn., July 19, 1912.

Tmeticus multidentatus. new

This species resembles *T. tridentatus* and *T. trilobatus,* but is smaller than either, measuring little over 1.5 mm. in length. The mandibles are strongly toothed on the front with one large tooth on the inner side and a row of five on the outer side, the lower one very small and the one next above the largest of the row. Fig. 1. The male palpi are long as in the related species. The patella has a slight spur on the under side at the end. The tibia is much widened and covers the base of the tarsus above and below and the upper projection has a complicated and characteristic shape consisting of a rounded lobe divided by a middle ridge around which it is partly folded. Figs. 1, 1 a, 1 b. Pl. II.

Brandon, Vt., Uncanoonuc Mt., N. H., Monponsett, Mass.

Tmeticus thoracicus. new

1.5 mm. long, legs and palpi pale, cephalothorax and abdomen both dark gray without markings. Cephalothorax wide behind and narrowed to the eyes in front. The male palpi have the tibia short and much widened toward the end. On the upper side the tibia extends in a long point over the tarsus and on the inner side is a shorter point less than half as long. The mandibles have no tooth on the front. Figs. 2, 2 a, 2 b. Pl. II.

Mt. Mansfield, Vt., July 10, 1911.

Tmeticus simplex. new

1.5 mm. long, entirely pale without any markings. Cephalothorax moderately wide and the head but little narrowed. Mandibles with a tooth in front near the end. Male palpi with the tibia short and wide two short teeth on the upper side of nearly equal length. Figs. 3, 3 a, 3 b. Pl. II.

Middleboro, Mass., Oct. 10, 1909, under leaves.

Microneta rotunda. new

2 mm. long, light yellow brown with the abdomen a little darker and grayer. The cephalothorax is nearly as wide and as long as in

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M. denticulata. The male palpi are short, the patella and tibia each as wide as long, and without processes. The tarsus is rounded and does not show the usual spur at the base. The tarsal hook is short and stout and curved in a half circle, ending in a point. A sharp ridge extends along the outer side of the hook about half way from the base, and then follows the middle line of the point. On the outer side of the hook where it begins to narrow toward the point is a small tooth. Figs. 4, 4a. Pl. II.

One male from Mt. Moosilauke at a height of 2000 ft. under leaves, May 29, 1912.

Micronета rectangulata. new

2 mm. long, light orange brown with dark gray abdomen. The mandibles are thickened at the base as in *M. viaria*, and narrow at the tip with a small tooth on the front just below the thickened part. The palpi have the tarsus comparatively narrow with a very small spur at the base. The tarsal hook is bent at a right angle, the outer portion thickened at the corner, but ending in a thin, wide tip. Figs. 5, 5a, 5b. Pl. II.

Readville, Mass., on a fence in the autumn flight, Nov. 5, 1911.

Bathyphantes duplicatus. new

3 mm. long. Cephalothorax and legs dull yellow without any definite markings except incomplete rings on the ends and middle of the joints of the legs. The abdomen is dark, nearly covered by transverse gray marks united in the middle over the front half. The male palpi have the tarsus longer than wide and as seen from above, narrow at the base where are two processes, one short and round on the outer side, and a longer and more slender one on the inner side. The tarsal hook is large and complicated and curved in a half circle. At its base it is narrow and has a row of stiff hairs and nearest the end of the tibia is a wide short irregular tooth. The more solid part of the end of the hook is widened and irregularly forked and under it is a thinner and translucent branch which extends in an irregular point beyond the forked end. Figs. 6, 6a, 6b. Pl. II. The Mt. Washington specimen has all the processes of the tarsus and tarsal hook smaller than the one from Katahdin.

Mt. Katahdin, Me., 2000 ft., July 6, 1910. Mt. Washington, on the Raymond path, Aug. 2, 1912.

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Bathyphantes furcatus. new

3 or 4 mm. long. Cephalothorax 1.5 mm., pale with gray markings. The cephalothorax has a square spot in the middle, running into an indistinct median line about half the length of the cephalothorax. The abdomen is marked with a broken middle line with several pairs of irregular and somewhat broken branches connecting with dark stripes below the middle of each side. The legs are faintly ringed with gray at the ends and middle of the joints. The epigynum projects one-fourth the length of the abdomen. The male palpi have the tarsus half longer than wide. The process at the base of the tarsus is unusually large and turns upward in a sharp point. Figs. 7 b, 7 c. The tarsal hook is wide and short, curved inward at the end and with two short teeth on the outer edge. On the outer side of the palpal organ is a long slender appendage with a shorter slender branch at about the middle. Figs. 7 b, 7 c. Pl. II.

Passaconaway, N. H. summit, in moss in bogs at 3000 ft. elevation. Mt. Mansfield, Vt.

Bathyphantes recurvatus. new

3 mm. long. Cephalothorax and legs pale without any markings. Abdomen with dark gray transverse marks partly connected with a median line at the front end. The male palpi have the tarsus rounded and not much longer than wide, the process near the base is slender and pointed and turned outward toward the tarsal hook. The tarsal hook is wide and long with the point rounded and dark colored and turned upward toward the end of the tarsus. At the inner side of the hook is a sharp tooth similar in shape to the one at the base of the tarsus. Fig. 8. Pl. II.

Gore Mountain, Norton, Vt., Aug. 6, 1912. One male.

Epeira emertoni Banks, Nearctic Spiders, Journ. N. Y, Entomological Society, 1904.

Female 6 mm. long, colors dull pale yellow with brown markings resembling in color as well as size *E. prompta* and without the bright yellow of *E. trivittata.* The abdomen, however, is not raised behind as in *prompta*, but is oval like *trivittata.* The middle folium does not extend to the front of the abdomen; it has a dark edge with white outside of it, and a dark middle stripe also bordered with white. The depth of color varies. In some individuals it is dark brown with the middle markings obscured as in the figure, and in some the folium is pale and lighter than the sides of the abdomen. The under

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side of the abdomen has a dark median stripe in which is a long light spot. The sternum is dark. The first legs are one-fourth longer than the second in both sexes. The finger of the epigynum is pale, long and pointed.

The male is smaller than the female, my specimen about half as large. The second tibia is a little thicker than the first but has the usual spines and is not modified in shape. Figs. 9, 9a, 9b. Pl. II.

Buttonwoods near Providence, R. I., in low bushes, June 20, 1912. Described by Banks from Sea Cliff, Long Island, N. Y.

Glyptocranium cornigerum, Hentz,
Ordgarius cornigerum, McCook, American Spiders, Vol. 3, 1894.

Male 1.5 mm. long. Cephalothorax low in front, rising backward to a pair of forked spines a little behind the middle. The upper middle eyes are raised on low ridges and the sides of the cephalothorax are slightly roughened and ridged around the base of the spines. The abdomen is wider than long, and nearly as high as wide, with two rounded tubercles in front and several pairs of round opaque and slightly depressed spots. The legs have no peculiar modifications and the spines are slender and indistinguishable from the hairs. In alcohol the cephalothorax and legs are orange brown and the abdomen pale yellow. Figs. 10, 10a. Pl. II.

The male palpi are short and simple. The tarsus has a small hook and the palpal organ a small and straight tube and a stronger terminal hook, both a little darkened in color.

Ponemah, Milford, N. H., Aug. 1912, Miss E. B. Bryant.

Cercidia prominens.

This well-known European species mentioned by Banks from Franconia, N. H., 1904, has been again found at North Woodstock, N. H. in 1911 by Dr. Wm. H. Fox.

The largest of these specimens are 5 mm. long and resemble in general the genus *Singa*. The color in the lighter parts is pale dull yellow and it is marked with dark brown and black. The legs are ringed with brown at the ends of the joints and in the middle of the tibia and metatarsus, and the cephalothorax has brown spots at the sides and behind the eyes. The abdomen has several pairs of dark transverse markings composed of finer black and brown spots. The front end of the abdomen has a blunt point which extends over the thorax and on each side of this point is a row of four or five black spines. The back of the abdomen is two-thirds covered by an oval

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thickened spot a little more opaque than the rest of the skin, and toward the front roughened. On the under side the sternum is dark and the abdomen is dark with two light stripes. This species should be looked for among the White Mountains and northward. Figs. 11, 11a. Pl. II.

Clubiona latifrons. new

6 mm. long. Pale, only slightly darker on the head and mandibles. The head is wide, nearly as wide across the eyes as the widest part of the cephalothorax. Fig. 12b. Pl. II. The mandibles are long and stout in both sexes and have on the inner side three large teeth above the claw and two below it. Fig. 12. The male palpi have the tarsus and palpal organ small. The tibia resembles that of *C. rubra*, with two short processes parallel to each other on the outer side. The epigynum also resembles that of *C. rubra*.

Plum Island, Ipswich, Mass., September. Dighton, Mass., September.

Lycosa funerea Hentz.

Allocosa funerea Banks. N. Y. Ent. Soc. 1904.

A young female of this southern species has been found at Lyme, Conn. among the straw along the shore.

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PLATE I

1 Theridium maxillare, dorsal markings. 1a ventral markings 1b, 1c, male palpus.
2 Theridium cinereum, dorsal markings. 2a, 2b male palpus.
3 Dipoena buccalis, cephalothorax from above 3a cephalothorax from the side. 3b markings of abdomen.
4 Dipoena pallida, dorsal markings. 4a sternum and mouth parts. 4b male palpi. 4c side of cephalothorax.
5 Ulesanis serrata. 5a sternum and maxillae. 5b cephalothorax from above.
6, 6a, 6b Areoncus littoralis.
7 Lophocarenum hartlandianum, head and male palpi. 7a male palpus from the side.
8 Lophocarenum bicarinatum, head and palpi of male. 8a head tipped forward. 8b, 8c end of palpus.
9 Lophocarenum sylvaticum, cephalothorax from the side. 9a head and palpi of male. 9b, 9c male palpus.
10 Lophocarenum coriaceum, back of male. 10a side of cephalothorax. 10b palpus of male.

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PLATE I

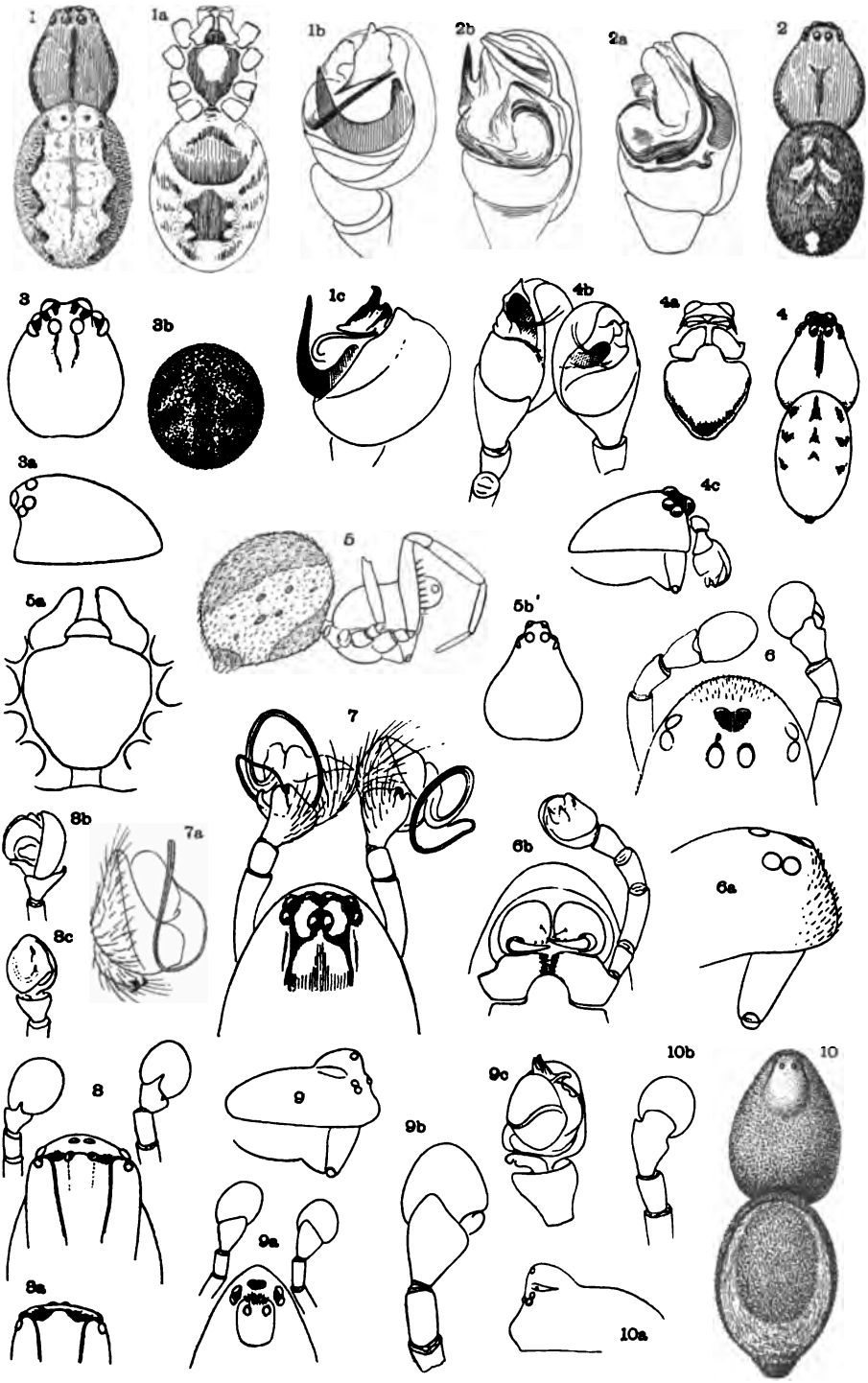

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PLATE II

1 Tmeticus multidentatus, mandibles and palpus of male. 1a, 1b male palpus.
2 Tmeticus thoracicus, male palpus from above. 2a palpus, outer side. 2b palpus, inner side.
3 Tmeticus simplex, male palpus from above. 3a, 3b male palpus outer side.
4 Microneta rotunda. 4, 4a male palpus.
5 Microneta rectangulata, cephalothorax and mandibles. 5a front of mandibles. 5b male palpus.
6 Bathyphantes duplicatus, base of tarsus and tarsal hook, 6a tarsus and hook from above. 6b tarsus of male palpus from Mt. Katahdin. 6c tarsus of male palpus from Mt. Washington.
7 Bathyphantes furcatus, dorsal markings of female. 7a side of female. 7b, 7c male palpus.
8 Bathyphantes recurvatus, male palpus.
9 Epeira emertoni, female. 9a male with legs I and II. 9b palpus of male.
10 Glyptocranum cornigerum, back of male. 10a male palpus.
11 Cercidia prominens, back of female.
12 Clubiona latifrons, mandibles and palpus of male. 12a side of palpus. 12b front of head and eyes.
13 Lycosa funerea, young female.

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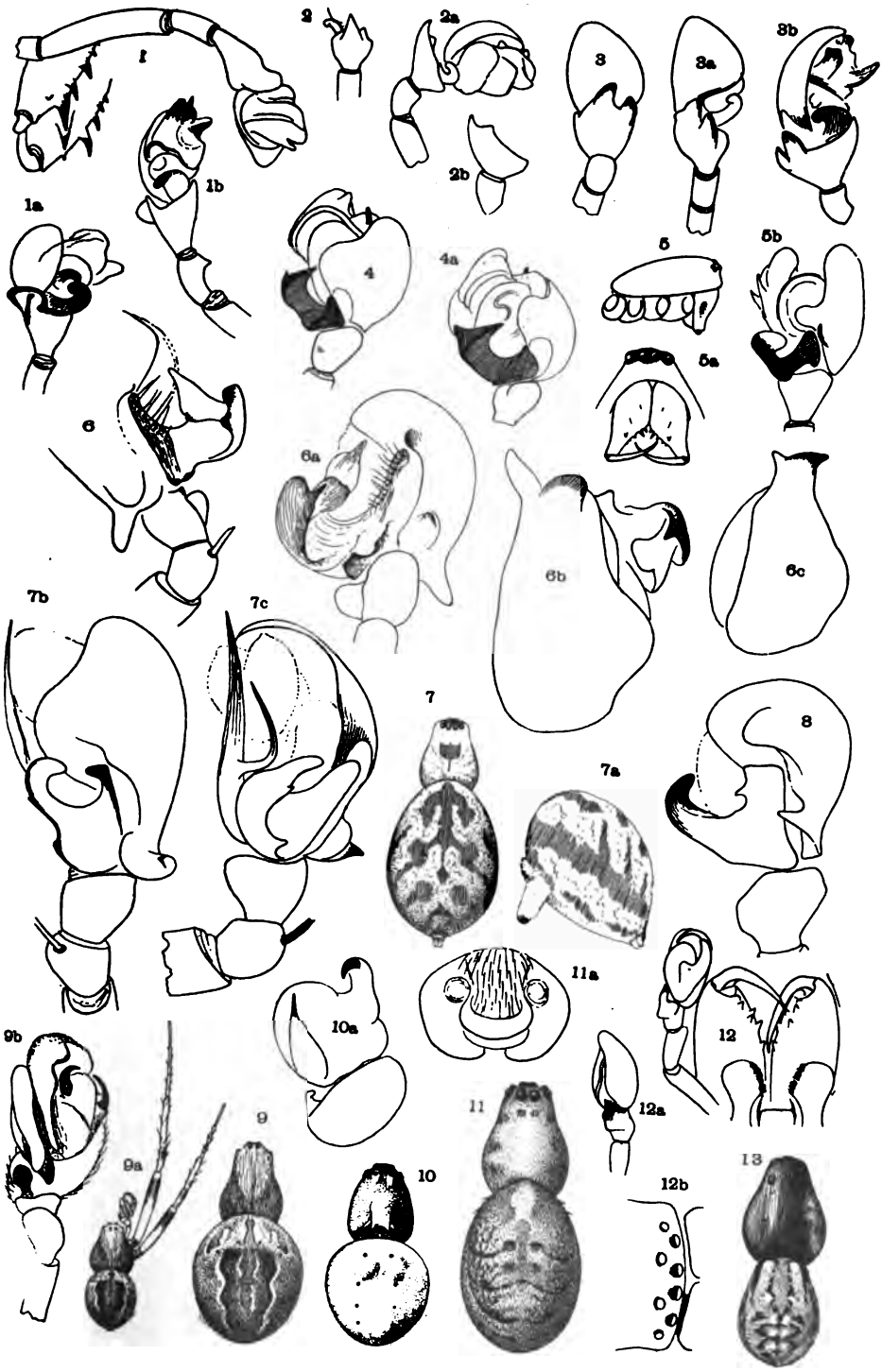
PLATE II



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TRANSACTIONS OF THE
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The Life and Works of Henry King, D.D.

BY

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YALE UNIVERSITY PRESS
NEW HAVEN, CONNECTICUT
1913

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DEDICATED,

IN GRATITUDE AND AFFECTION,

TO

A. M. C. S., E. C. S.,
E. R. C., AND F. S. C.

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IV.—THE LIFE AND WORKS OF HENRY KING, D.D.

By Lawrence Mason, Ph.D.

BIOGRAPHY.

I. ANCESTRY AND PARENTAGE.

Henry King was sprung from distinguished forebears. He claimed descent from the ancient Saxon kings of Devonshire, and though Wood rather ridiculed this idea,[1] the Herald's College did not question the family's right to the use of the appropriate armorial bearings.[2] However this may be, the eminence of Henry King's ancestors in the sixteenth century was considerable. For a great-grand-uncle, Robert, was last Abbot of Osney and first Bishop of Oxford.[3] A grandfather, Philip, was "sometimes page to Henry the VIIIth."[3] Intermarriage with families of title or estate was common.[4] And perhaps the most notable among the many prominent scions of the race, namely, Henry King's own father, now remains for more extended mention.

John King, one of Philip's twelve children,[5] was born in or about the year 1559[6] at Worminghall or Wormenhale, "commonly called Wornal,"[7] in Buckinghamshire. Proceeding from Westminster School to Christ Church, Oxford, in 1576, he there in due course of time accumulated the various degrees of B. A. (1579), M. A. (1582), B.D. (1591), and D.D. (1601 or 1602), as well as becoming Proctor of the University (1589) and Dean of Christ Church (1605) and then for four years (1607—1610) Vice-Chancellor of the University,[8]—truly

[1] "Athenae Oxonienses," ed. Bliss, 1815, II, 774, 775.

[2] "Poems and Psalms, by Henry King," ed. Hannah, 1843, ii and footnote.

[3] "The Church History of Britain," by Thomas Fuller, ed. Brewer, 1845, V, 499.

[4] "Athen. Oxon.," II. 294; Hannah, op. cit., iii and Appendix A.

[5] Hannah, *Ibid.*

[6] If he died in 1621, aged 62, as Wood says; "Athen. Oxon.," II, 296.

[7] Wood, *Ibid.*

[8] "Fasti Oxon.," ed. Bliss, I, 212, 221, 257, 292, 248, 320, 324, 333, 337; "Alumni Westmonasterienses," new ed., 1852, pp. 53, 54. His election to the Deanery was a marked honor, for he seems to have been called to Christ Church by popular demand in a special petition to King James signed by thirty-two representative undergraduates; in this petition he was described as "clarissimum lumen Anglicanae ecclesiae" ("Athen. Oxon.," II, 295).

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an honorable career. In his undergraduate days an important event may have taken place which supplies a connecting link ignored by his biographers, for it may well have been at college that John King's descent, person, or abilities first recommended him to John Piers, Dean of Christ Church from 1570 to 1576.[1] Piers, becoming Bishop of Rochester (1576), of Salisbury (1577), and Archbishop of York (1588), presently made King his domestic chaplain and in 1590 installed him as archdeacon of Nottingham. In 1590 or 1591 King married Joan, "daughter of Hen. Freeman of Staffordshire,"[2] and this quaint little epigram on the occasion is perhaps worthy of extraction from Malone MS. 19, p. 98, in the Bodleian:

> *"Verses gave to Dr. King & his wife whose name was ffreeman at Ye Marriage dinnr.*
> A ffreeman yet noe man
> A Kinge, yet noe Queene,
> A wife & yet a mayde,
> The like was never seene."

Now King was no less a favorite at Court than at his University. For after the death of Archbishop Piers, he became chaplain to Sir Thomas Egerton, Lord Keeper of the Great Seal,[3] and then chaplain in ordinary to Queen Elizabeth, and later to James. Various rectorages and prebends were bestowed upon him by his influential patrons, and several livings sine cura were within his gift. In fact, his means must have been so considerable,[4] in view of the inheritance from Bishop Robert King as well,[5] that much fruitless conjecture has been expended upon the question of what became of the fortune;[6] per-

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[1] "Alum. West.," pp. 11,54.

[2] " Athen. Oxon.," III, 839; but the funeral certificate reads "of Henley in the county of Oxford," as quoted by Hannah, xci.

[3] " Alum. West.," 54.

[4] Godwin, "Catalogue of the Bishops of England," 1615, p. 106, gives the royal appraisal of the Bishopric of London as 1119l. 8s. 4d.

[5] Fuller, op. cit., 499.

[6] This paragraph from Manningham's Diary (ed. Bruce, 1868, p. 79) seems worth including in full, as it has apparently escaped the notice of John King's biographers. It shows that the diminution of his resources was due to no disregard of the temporalities on his part, and gives other interesting information about him. The entry occurs on fol. 58 of the MS. and is dated 3 Nov. 1602: "Mr. Gardner of Furnivales Inne told howe that Mr. King, preacher at St. Androes in Holborne, being earnestly intreated to make a sermon at the funerale of a gent. of their house, because the gent. desyred he should be requested, made noe better nor other aunswer, but told

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haps John King's patrimony, as one of many shares, was not so great as supposed, while the necessity for educating his own large family, for maintaining the state befitting his honorable position in life, and for contributing to his Church, his University, and his sovereign,[1] might well account for the very moderate though comfortable circumstances in which we find Henry King placed.

John King's promotion in the Church was as rapid as was his academic elevation. It culminated in his consecration as Bishop of London, September 8, 1611.[2] Apparently, though this has not been pointed out heretofore, nothing but his early death, ten years later, as compared with the greater longevity of George Abbot[3] and Tobias Matthew,[4] kept him from succeeding one of those two divines as Archbishop of Canterbury or Archbishop of York; for Le Neve's statistics[5] seem to show that especially at this time the Bishopric of London was the stepping-stone to an archiepiscopal see, and this translation would have been particularly likely in the case of a prelate enjoying so much popular and ecclesiastical esteem and royal favor as did John King. This fair record is marred by only one possible stain, and this blot doubtless seemed a very meritorious action to his contemporaries and so must be leniently dealt with to-day. For it was John King who "principally managed" the ecclesiastical prosecution of Bartholomew Legate which led to the latter's being

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them plainly he was not beholding to that house nor anie of the Innes of Chauncery, and therefore would not. He is greived it seemes because the gents. of the Innes come and take up roomes in his churche, and pay not, as other his parishioners doe. He is so highly esteemed of his auditors, that when he went to Oxeford" ("perhaps on his proceeding D. D., which he did in this year, 1602"—Bruce's note) "they made a purse for his charges, and at his return rode forth to meete him, and brought him into town with ringing, etc."—Another unnoticed reference to John King at this particular date is to be found in John Chamberlain's "Letters during the Reign of Elizabeth," Camden Society, 1861, pp. 143 and 149, with an amusing account of this commencement at Oxford, "very famous, for plentie of doctors, . . .; for store of venison, whereof Dr. Kinge had 27 buckes for his part; . . . . for the exceeding assemblie of gentles, but specially for the great confluence of cutpurses, whereof ensued many losses and shrewd turnes," etc.

[1] Cf. Henry King's Letter to the Archbishop of Canterbury, p. 289, inf.; "Alum. West.," 54; Fuller, 501; and "History of St. Paul's Cathedral," by Sir W. Dugdale, 2d ed., 1716, 140.

[2] Le Neve's "Fasti Ecclesiae Anglicanae," ed. Hardy, 1854, II, 303.

[3] *Ibid.* I, 26.

[4] *Ibid.* III, 116.

[5] *Ibid.* I, 20—31; II, 292—304; III, 112—116.

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burned at the stake in Smithfield, in 1612, for maintaining certain Arian heresies.[1] This cruel rigor is perhaps atoned for, in modern eyes, by the courageous firmness with which King opposed the divorce of Lady Frances Howard from the Earl of Essex, in 1613, despite the royal and political pressure brought to bear on the commissioners in that trial.[2] Nor did he fall short in fulfilling the religious obligations of his high office, but "was so frequent, that unless hindered by want of health, he omitted no Sunday whereon he did not visit some pulpit in London or near it."[3]

It was as a preacher that John King was perhaps most highly praised by his contemporaries. He was appointed by the royal council to preach the funeral sermon over Elizabeth and the welcoming sermon to James. Honored by being summoned to the Hampton Court Conference, in 1604,[4] he was doubly honored by being afterwards selected, with three others, to preach before the Scotch Clergy, in 1606.[5] King James "commonly called him 'the King of preachers.' And Sir Edward Coke would say of him, 'he was the best speaker in Star Chamber in his time.'"[6] These, with other similar testimonials that might be cited, lead us to the conclusion that John King must have been singularly gifted in oral delivery and pulpit presence or magnetism, for his printed sermons seem cold and uninspired even after all due historical allowances have been made; they are certainly well-constructed and learned, with occasional passages of a rather formal and studied eloquence, but while they are distinctly above the average of the various seventeenth century

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[1] Fuller, op. cit., V, 418—423; Fuller openly applauds and exults, as in this passage: "Bishop King gravelleth him with a place of Scripture (John xvii, 5). This text, I say, was so seasonably alleged, so plainly expounded, so pathetically enforced, by the eloquence and gravity of that bishop, (qualities wherein he excelled,) that it gave marvellous satisfaction to a multitude of people there present," etc. "See here it is neither the pain nor the place, but only the cause makes a martyr . . . Never did a scare-fire at midnight summon more hands to quench it, than this at noon-day did eyes to behold it."

[2] Fuller, op. cit., V, 431, 432; "History of England, 1603—1660," by F. C. Montague, 1907, 63, 64; "Progresses of James I," by John Nichols, 1828, II, 726, where the statement in the text, "The Archbishop of Canterbury was at the Marriage, but not the Bishop of London," is thus supplemented in the foot-note: "These two Prelates, Dr. Abbot and Dr. King, to their immortal honour, had been the chief opposers of the shameless divorce."

[3] Fuller, op. cit., V. 500.

[4] *Ibid.*, p. 266.

[5] Nichols, op. cit., II, 96, 97.

[6] Fuller, op. cit., V, 499.

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pamphlet sermons examined in connection with the present investigation, they simply are not comparable in absolute value with the great literary orations of John Donne and other real masters of the form at that time.[1]

Bishop John King died March 30, 1621, after more than fourteen years[2] of suffering from stone in the reins and bladder, "and was buried in the South-Isle, over against the Quire, in the Cathedral Church of *S. Paul*, under a flat Marble, and had a long Epitaph inscrib'd in a Table hanging by,"[3] "with the simple word 'Resurgam' on his gravestone."[4] A very moving account of his last days will be found in his eldest son's sermon preached nine months later in answer to the "aspersion as false as foul . . . that at this death he was reconciled to the church of Rome."[5] This absurd charge, "sufficiently confuted by those eye and ear witnesses present at his pious departure,"[6] has its only suspicion of probability lent to it by the alarmed and abusive and over-elaborate denials it has evoked from all Anglican biographers and historians of this period. The sermon just mentioned,[7] with its accompanying legal retractation of the libel by the libeller, should have settled and dismissed the matter forever. Bishop John King's fair fame is unimpeached, nowadays, and he left a record that none of his sons equalled; for Grosart's statement, "his sons grew into a fame that over-shadowed his own,"[8]

[1] Since all King's biographers, from Wood down, have been at great pains to catalogue such of his sermons as are mentioned or extant anywhere, it may be worth while to record two hitherto unnoticed London sermons of his as very copiously taken down by John Manningham: (1) Oct. 24, 1602, at Paul's Cross, on 2 Peter II, 4, 5, 6, 7, 8, 9; and (2) Mar. 27, 1603, at White Hall, on Luke XI, 14 et seq.—Manningham's Diary, ed. Bruce, 64—72, 149—153.

[2] "Athen. Oxon.," II, 295, footnote 6.

[3] "Repertorium Ecclesiasticum Parochiale Londinense," by R. Newcourt, 1708, I, 29.

[4] "Alum. West.," 54; cf. Henry King's elegy on his father, with reference to this "simple word"; and cf. Bibliog., pp. 280, 283, for notice of this "long Epitaph inscrib'd in a Table."

[5] Fuller, op. cit., V, 500.

[6] *Ibid.*

[7] Cf. Bibliog., p. 275, inf. Cf. also the second sentence of Henry King's "Epistle Dedicatory" in his "Exposition upon the Lords Prayer," 1628: "something was done to disprove that (*since confessed*) scandall, touching my Father's Revolt from his Religion."

[8] "Lectures upon Jonah," by John King, in "Nichol's Series of Commentaries," 1864, with biographical introduction by A. B. Grosart, p. xii;

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is wildly untrue of their own life-times and is beginning to be true in part only with the growing recognition of Henry King's right to a place in English literature and literary history.

II. EDUCATION AND EARLY LIFE.

Henry King, the eldest son of Bishop John King, "was born in the same house and chamber at Wornal, in Bucks, wherein his father had received his first breath,[1] in the month of January [1592], and was baptized there on the 16th of the said month [; he was] educated partly in grammar learning in the free-school at Thame in Oxfordsh. and partly in the college school at Westminster."[2] From Westminster he followed his father to Christ Church, Oxford, matriculating Jan. 20, 1609, and took the same four degrees: B.A., in 1611; M.A., in 1614; B.D. and D.D., in 1625.[3] Among Henry King's fellow-scholars at Westminster were Robert Herrick (if Mr. A. H. Bullen's conjecture be correct: "Dict. Nat. Biog.", XXVI, 253), George Herbert, William Strode, William Cartwright, and Thomas Randolph,[4] but the great Camden, who had taught his father,[5] was no longer a master there; and later, among the "many afterwards eminent men in attendance, as students, or [as candidates] for advanced degrees," at Christ Church during his undergraduate days, Grosart mentions John Williams, afterwards archbishop and lord chancellor, Edward Littleton, Brian Duppa, Christopher Wren, John Hales, Williams Strode, and John Donne.[6] Inspiration and competition in abundance were therefore afforded King by both institutions, as well as a perhaps not less important or influential element, namely the warm friendship of at least two of these notables—Brian Duppa and John Donne. He does not appear to have

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on pp. x and xi Dr. Grosart gives an account of King's death, with lengthy extracts from his son's sermon in defence of him, and adds a brief bibliography of "authorities *pro* and *con*" in the matter of the alleged apostasy. Chalmers ("Gen. Biog. Dict.", XIX, 357) refers readers to Dodd's "Church History," I, for a full discussion of this question.

[1] "A Local coincidence not commonly to be parrelelled."—Harl. MS. 1625, fol. 115.

[2] "Athen. Oxon.," III, 839.

[3] "Alum. West.," p. 77.

[4] "Robert Herrick: Contribution à l'Etude de la Poésie Lyrique en Angleterre au Dix-Septième Siècle," par Floris Delattre, Paris, 1912, p. 21.

[5] "Dict. Nat. Biog.," VIII, 279.

[6] Grosart, op. cit., viii, ix.

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been conspicuously successful in academic pursuits, in one field at least, for two of his younger brothers attained an honor which he did not achieve: John, who entered Christ Church and took all four degrees at the same time with him, became Public Orator of the University in 1622,[1] and was succeeded in that position by Philip, the youngest brother, in 1625.[2] Mention of this small failure seems to have been avoided by Henry King's biographers, but its statement, where facts are so scarce at best, seems worth while inasmuch as it casts little discredit and considerable light upon his development at this time.

"When he was young he delighted much in the studies of music and poetry," says Wood, "which, with his wit and fancy, made his conversation much accepted";[3] and "The Publishers" of his volume of poems, in their prefatory remarks, also call those productions "*Juvenilia* (most of them the issues of [his] youthful Muse)." This account of Henry King's youth, therefore, seems to be reliable enough; and certainly, blitheness of heart and verse was but natural in a young man with so fair a prospect in life opening before him. For it must not be forgotten that while he was a student at Christ Church his father was Dean of that College and Vice-Chancellor (i. e., actually president, for the Chancellor was merely an honorary officer) of the University, and then became Bishop of London with still greater opportunities to ensure a successful career for his son. This brighter, happier side of Henry King's nature is the more pleasant to contemplate, in view of the absence of any such graces in most of his published work; but perhaps the very gaiety of his life at this time may help to account for his failure to be elected Public Orator.[4]

Though, as will presently be seen, King's residence at Oxford must have terminated shortly after his taking his Master's degree, and though his private affairs and his ecclesiastical duties might well have occupied all his thoughts and leisure, he did not forget his Alma Mater but loyally rallied his poetical powers to her aid when a humiliating misfortune befell her. The jealous rivalry between Oxford and

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[1] "Alum. West.," p. 78.

[2] Hannah, xcvi; "Fasti Oxon.," II, 89, and cf. note 4, inf.

[3] "Athen. Oxon.," III, 839; based on Fuller's "Worthies of Bucks," ed. Nuttall, 1840, I, p. 202.

[4] Nichols, op. cit., IV, 1109, has this footnote: "He [Phil. Kinge] became Orator of the University (as his brother Henry, of whom in p. 1051, had been);" but on p. 1051 and p. 930 (to which it in turn refers), the Public Orator is correctly given as *John* King.

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Cambridge was at this time perhaps particularly bitter,[1] and the competition for royal favor and patronage was the bitterest point in the contention. In 1615 King James had visited Cambridge twice, the second time expressly to witness another performance of the play with which he had been entertained on the occasion of his first visit, namely "Ignoramus," by George Ruggle, fellow and tutor of Clare Hall.[2] The fame of this piece and the pamphleteering battle long waged over its satirical attack upon lawyers and Puritans spurred on the partisans of Oxford to a special effort in order to diminish the prestige of their rivals and win some laurels for themselves. Accordingly, it was determined to make a special excursion to Woodstock in order to present Barten (or Barton) Holyday's comedy called "Technogamia: or, The Marriages of the Arts" before the King and court, Aug. 26, 1621.[3] The play had met with only moderate success at its first hearing, February 13, 1618, in Christ Church hall; and though the author revised it[4] for its second performance, it nevertheless so bored the King that after the second act he attempted to leave and was with difficulty prevailed upon to sit out the play, "least the young men should be discouraged."[5] Such an opportunity was not to be passed over in silence by the foes of Oxford, and numberless mocking epigrams and taunting satires immediately sprang into active circulation. The most popular of these squibs, in a new form, occurs in MS. on a small slip of paper inserted to face p. 22 in the British Museum copy of King's poems catalogued under shelf-number 11,623.aa.26.,[6] and may be given here as a sample of what King undertook to answer in his impassioned and (for a dignitary in an established church) outspoken lines "To his Friends of Christ Church upon the mislike of the Marriage of the Arts acted at Woodstock":

> "At Christ Church Marriage, play'd before the King,
> His Majesty did make an Offering.
> An Offering! He offered what, I pray?—
> He offered—twice or thrice to go away."

[1] Cf., e. g., "Annals of Oxford," by J. C. Jeaffreson, 1871, Chapter I.

[2] Many accounts of play, author, and furore caused, have been written; the brief summary in "Dict. Nat. Biog.," xlix, 392—3, is perhaps most widely accessible.

[3] "Athen. Oxon.," III, 522.

[4] "making some foolish alterations in it,"—"Athen. Oxon.," *ibid.*

[5] *Ibid.*

[6] Cf. Bibliog., p. 264, inf.

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King's indignant response in defence of his Alma Mater is very creditable to him from several different standpoints;[1] and followed as it is, in the *editio princeps*, by the interesting group of doubtfully autobiographical poems, it may well serve to close his educational period and introduce the next division of this sketch of his history.

III. PRIVATE LIFE: HUSBAND, FATHER, FRIEND, AND POET.

Fuller and Wood make no mention of Henry King's wife; Bayle[2] and Lipscomb[3] assign him his son's wife, Anne Russell. King himself did not mention her name in any of his extant poems, letters, or sermons. Hannah[4] was the first to bring her name to light, as the reward for painstaking researches,[5] and a brief statement of his results will therefore summarize all hitherto available information about this marriage. Henry King, then, married Anne Berkeley, eldest daughter and heiress to Robert Berkeley, Esq., who was the son of Sir Maurice Berkeley (Standard Bearer to Henry VIII, Edward VI, and Elizabeth), of Somerset and of Boycourt (or Boycote), Kent. Hannah infers that the marriage took place about 1617, after King had vacated his studentship at Oxford and moved to London, and that by 1624 at the very latest Anne Berkeley King had died and been buried in St. Paul's Cathedral. John, the eldest son of this marriage, died in infancy; the second child was also a son, and was given the same name; the third, a daughter christened Anne, was born in February, 1621; and the fourth, a son named after his father, was born, as Hannah conjectures, in 1622 or 1623. Furthermore, inasmuch as John and Henry both lived to maturity, while their father early penned a mournful elegy "On two Children dying of one Disease, and buried in one Grave," Hannah very naturally surmised the birth of another child; for it appears from lines 11 and 12 of the elegy that the two children here lamented survived their mother, and con-

[1] One cause for King's anger was injured family pride, if Hannah be correct in stating that two of his "younger brothers, William and Philip, were among the Actors of Holiday's unlucky Comedy."—p. x, footnote; but Hannah's presumable source (Nichols, op. cit., IV, 1108—9,) identifies only "Ds. Phil. Kinge" as Bishop John King's son, giving no account of "Ds. Guil. King."

[2] "General Dictionary," 1739, VI, 528.

[3] "Hist. and Antiq. of Bucks," 1847, I, 585.

[4] Op. cit., xii—xv and Appendix A.

[5] The MSS. brought to light in connection with the prosecution of the present work would have settled the question, had not Hannah already arrived at the correct conclusion. Cf. pp. 283, 284, inf.

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sequently the first-born son John[1] could not have been referred to in it.

It now remains to supplement Hannah's facts and confirm or replace some of his inferences and hypotheses, by means of information found in certain MSS. which escaped his investigation. In Appendix A is printed part of a 140-line poem by Thomas Goffe, entitled "An Elegie upon ye death of Mris. Anne Berkley, wife to Mr. Henry King,"[2] preserved (unfortunately without date) in Rawl. MS. D. 398, ff. 172–173v, in the Bodleian. Thomas Goffe had been at Westminster and Christ Church for many years with Henry King, and, though a professed "enemy to the female sex,"[3] might well have attempted to enter into his friend's feelings and mourn his loss of such a model wife; moreover, Goffe says in line 118 that he offers this tribute "As my last homage to my deerest freind," as if he had known Anne Berkeley personally. So there seems to be no reason for rejecting the testimony of this piece, especially as one of its doubtful points is corroborated by the preceding elegy.[4] From it, then, we learn (line 13, page 284) that three sons survived their mother; this substantiates Hannah's surmise as to the fifth child, and tells us that it was a boy, and this information is corroborated by line 24, page 284, "An Epitaph" on Anne Berkeley by Henry King's brother, John. Evidently, neither Goffe nor John King paid much attention to the existence of little Anne, but that was commonly the practise in those times; sons were counted, daughters ignored. In Collinson,[5] e. g., no mention is made of Anne's mother, even though a large estate passed with her out of the Berkeley family. Furthermore, we learn from Goffe's elegy (lines 15–18) that *two* sons had died before their mother; this brings the total number of Henry King's family up to six,—not an improbably large figure, in view of his father's nine and his grandfather's twelve. And, finally, we learn from Goffe's elegy (lines 1–8) some facts (for the statement would have been absurd or even offensive, unless reasonably accurate) which enable us to offer some hypotheses in regard to the

[1] Touchingly grieved for in a separate elegy included among the Additional Poems Hitherto Unprinted, in the ed. of King's poetry to be published by the Yale Press.

[2] pp. 284–5, inf.

[3] "Athen. Oxon.," II, 463; Wood tells with much gusto the story of his betrayal into marriage with "a meer Xanthippe" and his consequent early death, "heart-broken"; but Wood's malicious, satirical habits cast some doubt on such stories.

[4] p. 283, inf. [5] "Hist. and Antiq. of Somerset," 1791, III, 280, 281.

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missing dates of these births, as well as of those of the marriage and of Anne Berkeley's death. The one fixed date is that of the birth of little Anne King, for Bishop John King's funeral certificate[1] states that she was five weeks old when that license was issued, and therefore must have been born in the last week of February, 1621. Following out Goffe's suggestion, now, we may infer that the son John who lived to grow up must have been born in January, 1620, say, or at the end of 1619 (for the funeral certificate gives his age as, roughly, a year and a half, in early April, 1621); the first-born son John, who died in infancy, would have been born, then, about the end of 1618; and the marriage would have taken place early in 1618, or towards the end of 1617. Starting with Anne's birth, again, in late February, 1621, we may suppose that the fourth child, Henry, was born in March or April, 1622;[2] that the fifth child, also a son—perhaps the second who died before the mother,—was born in May or June, 1623; and that the sixth and last, also a son—perhaps one of the "two Children dying of one Disease" after their mother's death,—was born in July or August, 1624. It seems fairly reasonable, next, to assign Anne Berkeley's death to the last half of 1624; for she died of a "Feaver,"[3] and was buried in St. Paul's,[4] and neither of these statements could well have been made if she had died in London in 1625, for that would practically mean dying of the plague.[5] Moreover, in 1625, Henry King was in Oxford, taking his D.D. and avoiding the plague,[6]—and incidentally, in all probability, bearing the news of his wife's recent death to Goffe's sympathetic ears; and finally, she could not have died in this plague-interval, or surely her husband would have made some reference to his loss when he resumed his interrupted series of sermons on the Lord's Prayer in London,[7] or in his "Act Sunday" Sermon at Oxford, in July, 1625.[8]

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[1] Hannah, xci, xcii.

[2] He died Feb. 21, 1669, in the 46th year of his age; i. e., he was not quite 47.—Hannah, xciii.

[3] As her husband's beautiful elegy shows. [4] Hannah, xv.

[5] "In 1625 is the third great London plague with 35,417 deaths—though the year 1624 was remarkably exempt, and 1626 nearly so." Encyc. Brit., XIth ed., xxi, 695.

[6] Cf. Bibliog., p. 278, N. 1, inf.

[7] *Ibid.*, notice the unconcerned, impersonal tone of his resumption: "though the Contagion which lately dispersed us, hath diminished many of those hearers," etc.—"Exposition on the Lords Prayer," 1628, p. 243.

[8] Bibliog., p. 275.

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The first poem in Appendix A is one of several by John King on his sister-in-law's death. For instance, in Harl. MS. 6917, ff. 89v–90, occurs a 36-line piece signed "Dr. John King," and entitled "A letter to his most loving brother H : K : upon the death of his Late Wife";—it is a very poor performance, marred by wretched conceits, as the opening quatrain will clearly show:

> "When other poets veines are done
> Snt Giles my muse bids me halt on,
> and if my verses have some hobs,
> thinke I have used not feete, but sobs." . . .

This effusion is followed immediately by two pieces, the second of which is also signed "Dr. John King," with these titles: "Upon a Ringe bequeathed as a Legacy from my loved sister[1] Mrs. A : K :" and "Upon the Candle-stick she gave mee." These various pieces possess but little poetical value, but with Goffe's tributes, they help to show that Anne Berkeley King was fully worthy of the beautiful lines to her memory inscribed by her bereaved husband, perhaps his highest achievement in poetry.

Now, the question arises, was Henry King loyal to her memory, or did he write about, woo, or perhaps even win, a second wife? It all depends upon four of his poems: are they authentically autobiographical, or are they mere "dramatic lyrics" in which King deals imaginatively with fashionable subjects and attitudes? "The Surrender" and "The short Wooing" might possibly have been written to Anne Berkeley, in the earlier stages of Henry King's courtship; but "St. Valentines day" is obviously the salutation of a widower to the lady who has consented to share his lot, and if King wrote the lines they present a very puzzling problem.[2] Second marriages were frequent in this family: his sister Anne married twice, and her first and second husbands were both widowers; his sister Elizabeth and niece Elizabeth Holt both married twice; and his wife's grandfather, Sir Maurice Berkeley, also remarried.[3] But Henry King's ample and beautiful vindication (if any be needed)

[1] As his sister Anne long survived him (Hannah, cii, ciii), he must refer here to his sister-*in-law*, Anne Berkeley King; so Henry King twice refers in his Will (Hannah, cxi) to his brother-in-law, Edward Holt, as "my (deceased) Brother, Edward Holt, esquire."

[2] Hannah, in omitting this poem from his selection, and in failing to consider the question at all, seems almost guilty of shirking a responsibility.

[3] Hannah, xcviii—ciii; Collinson, op. cit., p. 280.

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is to be found in the fine, sane lines of his own poem, "The Legacy," apparently addressed to Anne Berkeley during their married life. The only positive bit of evidence (if it can be deemed such) to support this theory of King's second marriage is a passage in a hitherto unprinted poem which can only doubtfully be assigned to King (viz. lines 40 and 41, page 286); note the wording here: she is never called "thy mother," but only "thy Sires wife"; and note the tone of lines 40–46: there is no love mentioned, but merely the idea of helpmate and safeguard, an idea perfectly in accord with the sober common-sense of "St. Valentines day"; and finally, note the date, 1630.[1] The total absence of any other mention of the event is not especially significant, for evidence as to the details of the first marriage and of all the private life of Henry King is exceedingly scanty. A further objection, in the fact that the printer-editors of the *editio princeps* did not place "St. Valentines day" with the obviously autobiographical poems is also lacking in weight; for the arrangement of the volume is far from thoroughly systematic, evidently, and then too the poem was placed with a considerable group of quasi-autobiographical pieces immediately after an indubitably personal poem, and finally the piratical printers[2] may well have been ignorant of an episode twenty-five years old[3] in their author's private life. As for the clause in his Will (Hannah cxii), "to her who was soe nearly related to my most deare and never to bee forgotten Wife," the absence of any surviving relatives of this other wife would make such language perfectly natural and proper. On the whole, then, it seems quite as likely that Henry King did marry again as that he did not do so.[4]

[1] It is, of course, impossible that Anne Berkeley could have been alive in 1630, or much if any later than 1624, in fact; for Henry King says of her, in "The Exequy," that she was "scarce" 24 when she died, and so even if she died in 1624 she would have been only 17 or 18 when she married. Furthermore, the 1630 here presumably stands for 1631.

[2] Their own preface confesses the unauthorized character of the venture.

[3] This would give 1632 as the approximate date of the second Mistress Henry King's demise; if she existed at all, she probably did not have many years of married life, or some mention of her would have come down to us. At least, the shorter her life, the easier it is to understand the absence of such mention.

[4] It is to be remembered that even in the case of a far better known seventeenth century writer, no less famous and familiar a figure than Izaak Walton, in fact, doubt on the question of his second marriage was not dispelled until very recently; cf. Keble's ed. of "Hooker's Complete Works," 1851, I, footnote 2, page 61; Nicholas' Walton, 2d ed., 1860, page v, etc.

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Henry King's various places of residence thus far noted or implied have been Wornal, Bucks, his birth-place; presumably Nottingham, Yorks,[1] and possibly Berkshire,[2] where his younger brothers were born; Thame, Oxfordshire, and Westminster School, London, followed by Oxford, his several stages of education; after 1614, when he took his M.A., "a house belonging to his Father, near St. Paul's Church Yard," London;[3] and Oxford again, in 1625, to avoid the plague. As his sermons seem to have been delivered in London,[4] it may safely be assumed that his connection with St. Paul's and with the royal household kept him chiefly in London in spite of his various ecclesiastical preferments elsewhere, to be noted presently,[5] until his elevation to the see of Chichester transferred his residence to Sussex at the opening of the year 1642. Here he passed less than eleven months, when the siege and capture of Chichester by the Parliamentarians, Dec. 29, 1642,[6] dispossessed him until the Restoration, and then Chichester became his residence again for the last nine years of this life, 1660–1669. The period of his exile from his bishopric, 1643–1660, is very difficult to account for. Wood and Fuller lend nothing to Walker's statement, which is as follows:[7] "When the rebellion broke out, he was most Barbarously Treated by them [i. e., the Puritans]; nor was he suffered to live quietly at his Friend's House (for sometime at least) when they could discover him. During the Usurpation he lived most with Sir Richard Hobart (his Brother-in-law) at Langly in Bucks; and, if I am not mis-informed, was in a manner Sustained by his Charity. He lived sometime with his Family, and some other Relations, at the Lady Salter's near Eaton; where Mr. Hales Officiated as Chaplain, according to the Orders of the Church, but was soon forbid by the Parliament." This is practically all that has hitherto been known about this period in King's life,[8] if we except what may be inferred from his own writings;[9] but this information still casts little light on the years

[1] "Athen. Oxon.," II, 632.

[2] Hannah, v.

[3] *Ibid.*, x.

[4] Cf. Bibliog., pp. 275 et seq.

[5] p. 249, inf.; note that even the Deanery of Rochester, received in 1638, does not prevent Letter II (p. 288, inf.) from being written in London, 1639, or Sermon 6 (Bibliog., p. 277) from being delivered "at Paul's," in 1640.

[6] "Victoria History of Sussex," I, 522.

[7] "Sufferings of the Clergy," 1714, Part II, p. 11.

[8] Hannah, lii–lix, enlarges on these details but adds nothing of importance.

[9] Cf. the elegies on Edward Holt, Sir Charles Lucas, and King Charles I; the Preface to his metrical rendering of the Psalms, also, with his letter to Archbishop Usher on that occasion, gives some further indication of his whereabouts and occupations about 1651.

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before 1649 or 1650. For the exactitude of Walker's language here seems to have been unappreciated or misunderstood, heretofore. He clearly means that during the *Rebellion*, or Civil Wars, King was hunted from his friends' houses[1] and driven into hiding in various more or less remote regions; while during the *Usurpation*, or after the Commonwealth had been established and things had become settled once more, (or, as Wood puts it, "after episcopacy was silenced by the long parliament"), he passed "most" of the time with Sir Richard Hobart and later with Lady Salter. So evidently it is for the first few years after 1643[2] that information has been lacking; and information covering those years can now be furnished.

An unpleasant page in Bishop Henry King's biography is involved and must be written. Documents apparently in the form of a legal deposition are preserved in the Bodleian (Rawl. MS. D. 1361, fol. 389 et seq.), bringing against his eldest son, John, a charge of seduction in the case of the youngest daughter, "E.," of a certain "Mr. O." (Onslow ?), of "A." in "S." about June 1, 1646. The documents are all on the plaintiff's side and hence leave us in ignorance of what Henry King said in his son's defence; consequently he should not be too hastily condemned. But the charge is circumstantial and, in its first form, convincing; if it is true to the facts, Henry King as well as his son must have acted a very discreditable part in the affair. The elder King is alleged to have wrung his hands and lamented exceedingly, when informed of the matter, and at first to have urged his son to confess all and make all possible reparation; later, to have attempted to negotiate financially with "Mr. O."; and finally to have "roundly" denied the whole charge, challenged the plaintiff to produce evidence, and counseled his son to ignore the affair and go forward with his courtship of a certain noble damsel whom he had long been wooing. Some injudicious additions to "Mr. O.'s" earlier straightforward account, doubtless introduced with a view to furnishing specific proof of the younger King's baseness, rather weaken the plaintiff's case in later statements; but no record of the outcome of the suit, if the case was ever brought to trial, has been preserved. This episode is chiefly or only valuable as supplying

[1] For "Friend's House" can mean nothing else; cf. citation from Walker's MS., p. 242, Note 1, inf.

[2] Immediately after the capture of Chichester, Dec. 29, 1642, Bishop King was confined to his Episcopal Palace there and was later transferred to a London prison for a short period. — "Castles and Mansions of Western Sussex," by D. G. C. Elwes, 1876, p. 60.

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information of Henry King's whereabouts at this time. For we learn that King, after "being by ordinance of Parliamt put out of that diocesse [Chichester] nigh 4 yeares since, took up his abode in the pish [parish] of A. in the County of S., together with one Mris Holt then a widow [his eldest sister, Elizabeth], and his two sonnes, [John and Henry; and her three daughters], and divers servants"; this statement accounts for the period in King's life from 1643 onward to Nov. 2, 1646, when a meeting was appointed at the house of one "Mr. Richard Onslow," evidently not the plaintiff but probably a relative, in "Aldbury."[1] But shortly after this, the King and Holt families must have sought quieter quarters (and perhaps thus confessed their guilt) for in the last document in the series we find "Mr. O." deposing, under date of "February 20^{0} $164^{6}/_{7}$, Saterday," that he has sent his "sonne Georg" to communicate with "the Bp. of Chichester" at "Blacksware in Hartfordsheer." So here the unhappy incident closes; it is unpleasant, but contributes materially toward filling the gap in our knowledge of his life between 1643 and

[1] The identity of "A." or "Aldbury" in the county of "S." is not so obscure as a glance at the Gazetteer might lead one to suppose; for in the "Victoria Hist. of Surrey," 1911, III, 72, we find mention of a parish called Aldebury in the XIVth century, Aldbury in the XVIIIth century, and Albury to-day; and on page 74 of the same work this sentence appears: "Sir Richard Onslow and his son Arthur seem to have had some claim on the manor (Weston Manor, in Albury) from 1644 to 1677." But the matter is settled definitely by this note of Walker's, presumably the "raw material" for his notice in his "Sufferings of the Clergy" (quoted above, p. 240): "Dr. King, Bp of Chichester rector of Petworth, given him by the King to be held in Commendam, was most barbarously treated by the Parliament; Turn'd out of both his Livings, succeeded in the latter, by yt Grand Villain Chaynell, he was not suffered to enjoy himself quietly at his freinds Houses; but escaping one night privatly to the parish of Sheer near Guilford in Surry, he there liv'd a retir'd life with one of his acquaince by whose Charity he was maintain'd" (MS. J. Walker, c. 3, fol. 378v.) The parishes of Shere and Albury intermingled, until recently, and are five or six miles east and a little south of Guildford in western Surrey, dicectly north of Petworth and Chichester in Sussex. The reason for King's choice of Albury for a place of refuge may have been the fact that the Duncombe family had large holdings there in the seventeenth century (cf. "Vict. Hist. Surrey," III, 73—77), and Letter 2 in Appendix B contains a reference to King's "Cosen Duncumbe" (cousin through intermarriage between the Duncombes and Conquests, according to Hannah; xxxviii, N.). The reason for his choice of "Blacksware in Hartfordsheer," at his next removal, may perhaps be found in this sentence from the "Hist. Antiq. Herts," 1826, I, 413: Blakesware "is a fair Seat erected in this Parish

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1650. And, of course, it will not escape observation that a new point has also been added to our knowledge of the period from 1650 to 1660; for Letter 1 in Appendix B,[1] hitherto unnoticed by his biographers, furnishes evidence that early in 1657 King was back in his native county, Buckinghamshire, some distance south of his birthplace.

First as the eldest son of the Bishop of London, and afterwards on his own merits, Henry King came to be associated on a friendly footing with some very notable men of this century, and a good measure of his worth is afforded by the esteem in which they held him. The Lady Salter mentioned above, who afforded him such kind shelter in his extremity, was, according to Bishop Kennet,[2] "sister if I mistake not to Dr. Duppa," and Brian Duppa was an early friend of King's, at Westminster and Oxford,[3] as we have seen, as well as his predecessor in the see of Chichester; King preached a fine funeral sermon over his remains, at his death in 1662.[4] The most illustrious of King's friends was the great Donne, "ordain'd both Deacon and Priest, by Dr. John King, Bishop of London";[5] Izaak Walton's "Life of Donne" gives several interesting particulars of this friendship, including the important fact of Henry King's having been John

about 3 miles distant from the town (i. e., Ware, in the hundred of Braughin; cf. Note 6, p. 246, inf.) towards the East, which did belong to the Family of the *Hangers*, from whom it came to *John King*, Gent.," in the first half of the seventeenth century. "Vict. Hist. Herts.," 1912, III, 389, col. I, substantiates this statement. A further possible connecting-link in associating King with Hertfordshire might well be his friendship with Sir John Monson, or Mounson (cf. Bibliog., p. 270 N. 1, inf.), for "Through his wife, (Sir John) became possessed in 1645 of the manor of Broxbourne in Herts, which was the seat of the family for many years" ("Dict. Nat. Biog.," xxxviii, 196). Broxbourne is in southeasternmost Hertfordshire, about six miles from Blakesware; and the "Hist. Antiq. Herts," I, 566—7, supplies these hints as to the connections between the King and Monson families: "The church of Broxbourne is appropriated to the peculiar use of the Bishop of London . . . Sir Thomas Mounson was created Baronet, 1611; his son Sir John M. was invested Knight of the Bath at the Coronation of Charles I." In 1647, Henry King and Sir John Monson were probably in "quiet retirement" in Herts, where King would have had the opportunity mentioned by Monson in his Dedication of looking over the latter's MSS.

[1] p. 287, inf.

[2] "Collections," III: Lansd. MS. 986, fol. 76, in the British Museum.

[3] "Alum. West.," 73.

[4] Cf. Bibliog., p. 278, inf.; also p. 251, inf.

[5] Newcourt, "Repert. Eccles. Lond.," I, 51.

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Done's "most faithful friend *and executor*."[1] With Walton himself King could boast a friendship of forty years' standing, in 1664, as an invaluable letter[2] shows; this letter, too long for insertion here gives many new details about King's life, in particular the part he played in the preservation of the last three Books of Hooker's "Ecclesiastical Polity," and should be consulted in connection with this sketch of his life, together with the other letters in Appendix B. Several other friendships were commemorated by King in particular poems,[3] and so may be left to his own accounts.

Verse-writing was one of the accomplishments of the finished gentleman, at this time, and consequently Bishop John King[4] and all five sons[5] figure in various Oxford collections of verse (usually in Latin or Greek) in their day. Next to Henry, John seems to have written most frequently in English verse, as we have seen above,[6] and as the ascription of "My Midnight Meditation"[7] to him shows. But Philip, the youngest, is no mean contender for recognition here, for the whole *editio princeps* of Henry's poems was once assigned to him,[8] Wood notes a commendatory poem from his pen included among similar effusions by "Benj. Johnson, Mich. Drayton, etc.,"[9] and a fine elegy signed "Phill: King:" has been preserved in two MSS. in the British Museum.[10] There is, however, some ground for doubt as to the identity of the particular Philip King reponsible for the last two items, inasmuch as Wood[11] lists five other gentlemen of this name, in addition to Bishop John King's son, and all associated with Christ Church or Oxford at this same period! Whichever Philip King wrote the elegy seems to have had Henry King's "Exequy" in mind, or before him; and, in general, there is a distinct family likeness in the verse-productions of the several brothers, to be ac-

[1] Sir H. Nicholas' easily accessible ed. of Walton should be consulted for various details of King's friendships with Donne, Walton, Spenser, etc.

[2] This letter has not been reprinted in Appendix B because it is so easily accessible in any good edition or biography of Walton.

[3] E. g., the poems on Ben Jonson, Blount, and Sandys.

[4] "Alum. West.," 54.

[5] "Alum. West.," 77, 78; Hannah, x, footnote.

[6] Cf. p. 238, sup.

[7] A brief meditative poem, of no very great merit, included in the *editio princeps* of Henry King's poems.

[8] Cf. Bibliog., p. 265, inf.

[9] "Athen. Oxon.," II, 435.

[10] Addit. MS. 25,707, ff. 79v—81, and Harl. MS. 6917, ff. 28—29v.

[11] "Fasti Oxon.," II, 89.

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counted for partly by the prevailing fashions of the day and partly by the likelihood that the eldest brother's work would serve as model for the younger to imitate.

Henry King's little volume of verse seems to have failed of winning contemporary appreciation, for the original edition was twice re-issued with a new title-page in a vain attempt to dispose of the unsold copies ;[1] but it would be unjust to argue from this that the volume possesses little merit, for in the first place Vaughan's "Silex Scintillans" underwent precisely the same experience (the unsold sheets of the 1650 printing having been re-issued in 1655, with a new title-page), and in the second place immediate popularity is of course no criterion of absolute value. Furthermore this contemporaneous neglect was only apparent, not actual, as the following facts show: King's gratulatory or elegiac occasional pieces were given the place of honor in the various volumes in which they originally appeared ;[2] there are extant almost countless copies of various single poems by him in the innumerable MS. collections and commonplace books of the day,[3] and thus he enjoyed a very considerable circulation regardless of the fate of the piratical printed publication ; and finally there are some grounds for believing that this twice re-issued original edition may not have been the only printed collection of his poems, after all.[4] These facts, hitherto unnoticed or unconsidered, seem to show that Henry King was highly esteemed as an author, in many quarters,[5] and that he hit the taste of his time truly enough to be considered a satisfactory representative of the minor poets of the period.

Under the year 1669 this entry appears in the Register of Burials, at Chichester: "The Reverend Father in God Henry King Lord

[1] Cf. Bibliog., p. 263, inf. ; also 266.

[2] Cf. "Jonsonus Virbius," 1638, p. 16; Donne's "Poems," 1633, 1635, 1639, etc. ; "The Swedish Intelligencer," 1633, poetical appendix to the Third Part; and George Sandys' "Paraphrase upon the Divine Poems," 1638, prefixed pages of commendatory verse.

[3] It may be stated further that, in addition to the MS. volumes noticed below in the Bibliography, Harl. MS. 6917 is practically another such collection, for over 20 of King's poems appear in it, together with many others by or about his family. Other MSS. almost as markedly given up to King's work are Addit. MSS. 25, 303 and 25, 707, and perhaps Sloane MS. 1446,— all in the British Museum.

[4] Cf. Bibliog., p. 267, inf.

[5] Cf., e. g., Howell's "Familiar Letters," ed. Jacobs, 1892, II, 408, under date of 3. Feb., 1637.

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Bishop of Chichester departed this life September the thirtieth and was solemnly interred October ye 8th."[1] He had survived his four younger brothers and two at least of his sisters,[2] as well as his wife and five of his six children,[3] while his remaining son died fifteen months after him.[4] Hannah was mistaken, however, in his assumption "that we cannot carry the history of his family far beyond the Bishop of Chichester himself,"[5] for a correspondent in "Notes and Queries" says that "the Vicar of Brighton has furnished the pedigree of Bishop Henry King down to the present date,"[6] i. e., 1875, and the present writer in January, 1912, met at Chichester a Mr. Freeland who claimed connection by marriage with surviving descendants of the Bishop. Henry King's fair name and fame have been impeached in but one particular, which will be discussed in the following section; otherwise, Wood, Walton, Walker, and Fuller have nothing but praise for him, as "'the epitome of all honours, virtues, and generous nobleness,' and a person never to be forgotten by his tenants, and by the poor."[7] Despite the somewhat forbidding cast of feature and expression evidenced by his portrait, which hangs in the old Lecture Room, Christ Church, Oxford, there seems to be no ground for doubting the generous character of the man: his benefactions in behalf of Christ Church[8] and the poor of Worminghall[9]

[1] Hannah, lxxvii, where it is pointed out that Wood's date "the first day of Octob." ("Athen. Oxon.," III, 841), is simply a mistranslation of the Monumental Inscription, "Prid. Kalendas Octobris." These Monumental Inscriptions seem to have been strangely troublesome to the early biographers, for Welch ("Alum. West.," 77) quotes approvingly, "Major John King," as a suitable translation of "natu major Johannes King"!

[2] "Athen. Oxon.," II, 633; Hannah, xciii—ciii.

[3] p. 237, sup; Hannah, lxxvii, lxxviii.

[4] Hannah, *ibid.* [5] lxxix.

[6] "N. & Q.," 5th Series, IV, 370; cf. also "N. & Q.," 1st Series, III, 368—9, on Bishop John King's sermon "on behalfe of Paule's Church," signed "Richard John King." Moreover, a kind correspondent (Mr. W. L. King of Ware, Herts) has recently forwarded information that John King, D.D., Master of the Charter House, d. 1738, "had a brother Major King, whose daughter Mary became 3rd wife of Sir Francis Dashwood (Lipscombe Hist. Bucks, II, 222). Eliz^th^ Dashwood, niece of the aforesaid Sir Francis, married Andrew Archer of Umberslade, Warc., and at Umberslade was a King family using the Bishop's arms."

[7] "Athen. Oxon.," III, 841.

[8] "Athen. Oxon.," II, 775; "Memorials of Oxford," by J. Ingram, 1837, I, 7—8.

[9] "Hist. and Antiq. Bucks," by Lipscomb, I, 582—3.

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were considerable, while Elwes seems to think it incumbent on him to explain why so munificent a donor should have failed to exercise his bounty in the case of Chichester Cathedral,[1] and signs of personal efforts in the interests of friends and dependents are not infrequent.[2] With a difficult position to fill, in very troublous times, he seems to have acquitted himself worthily, on the whole, and to deserve a reasonable amount of the eulogy inscribed on his monument: "Natalium splendore illustris, Pietate, Doctrina & Virtutibus illustrior."[3] "He was buried on the South-side of the Choir, near the Communion Table, belonging to the Cathedral Church of Chichester,"[4] but his monument, after being twice moved in recent years, now stands in the North Transept at some distance from the grave where his remains lie interred.[5]

One further question of some interest arises in connection with the King family, in the seventeenth century, and that is the possible relationship of Edward King,[6] the subject of Milton's "Lycidas." But in the first place, no Edward appears in the King genealogies given by Hannah[7] and Lipscomb,[8] and in the second place the original memorial volume to Edward King as well as modern investigation[9] shows that his connections were Irish exclusively. A more serious difficulty arises in regard to the poem signed "Hen. King," in the memorial volume. Masson[10] unhesitatingly calls the author "one of the brothers of the deceased," but gives no authority for the statement; Hunter felt the uncertainty more keenly, and wrote: "There being two Henry Kings contemporaries and both writers of

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[1] "His own fortunes were probably at too low an ebb to permit him to undertake its restoration," i. e. after 1660.—"Castles, Mansions, and Manors of Western Sussex," by D. G. C. Elwes, 1876, p. 60.

[2] Walton's "Life of Donne"; "Athen. Oxon.," IV, 518; "Fasti Oxon.," II, 214; Letters mentioned in Bibliog., p. 281, inf.

[3] Walker, op. cit., Part II, 12.

[4] Newcourt, op. cit., p. 92.

[5] Personal observation of the writer, and conversations with the organist of the Cathedral, in January, 1912; according to Walcott, "Memorials of Chichester," 1865, p. 50, it then stood in the Processional Path at the back of the Reredos.

[6] Examples of Edward King's Latin verse may be seen in Nichols' "Select Poems," 1781, VII, 76—85.

[7] lxxxiii, lxxxvi.

[8] p. 585.

[9] Masson's "Milton," 1890, I, 187—192.

[10] *Ibid.*, 192.

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verse, a doubt may sometimes arise what belongs to each of them; as for instance, which of them wrote the Verses in Jonsonus Virbius."[1] In view of Bishop Henry King's connection with Oxford, the Court,[2] and Duppa;[3] Jonson's connection with Oxford[4] and the Court; and Duppa's connection with "Jonsonus Virbius,"[5] it seems only reasonable to ignore Hunter's doubt and to assign these "Verses" to the Bishop. In the case of the other lines, the facts and probabilities are these: in the Bodleian copy of the exceedingly rare little memorial pamphlet,[6] the poem signed "Hen. King" stands *first*, as if the writer were chief mourner, and contains these lines:

> . . . "though we
> Small sprigs or branches of the self-same tree
> Suffer the worst, since He the fairest arm
> Is torn away by an unluckie storm." (lines 79–82)

Now Bishop Henry King could not have been chief mourner, even if he knew Edward King at all—which there is no reason for believing; nor are the lines quoted applicable to him in any way; nor was there anything in his situation at this date to lead to his being associated with a Cambridge memorial volume. There seems to be no reasonable ground, then, for including this effusion even among the "Doubtful Poems" of Bishop Henry King, nor can the slightest association with "Lycidas" be claimed for him.

IV. PUBLIC CAREER, SERMONS, AND RELIGIOUS OPINIONS.

So many details in the life of Henry King have been given above that his various honors and offices may now be summarized in briefest outline. As his Academic degrees have already been mentioned,[7]

[1] Hunter's invaluable MS. "Chorus Vatum" in the British Museum, vol. III, fol, 280; cf. also vol. II, fol. 1. [2] Cf. p. 249, inf.

[3] Cf. p. 243, sup. [4] "Fasti Oxon.," I, 392.

[5] He was, of course, responsible for its publication. Cf. Howell's "Familiar Letters," ed. Jacobs, I, 332.

[6] "Obsequies to the memorie of Mr. Edward King, Anno Dom. 1638 (Device) printed by Th. Buck, and R. Daniel, printers to the Universitie of Cambridge, 1638." The contribution under discussion has the general title for its caption and contains 122 lines, beginning on page 1, sig. F2, and occupying $3^{2}/_{3}$ pages, being exceeded in length, in fact, only by "Lycidas," which fills the last six pages. In the accompanying volume of Latin and Greek elegies there are some Latin lines by Henry King, the responsibility for which must be fixed upon the author of the English elegy under discussion.

[7] p. 232, sup.

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only his preferments in the Church and at Court remain to be listed. He became successively chaplain to King James I, canon residentiary of St. Paul's (1615), archdeacon of Colchester (1617), canon of Christ Church (1623), chaplain in ordinary to King Charles I, dean of Rochester,[1] (1638), and Bishop of Chichester (1642; consecrated, Feb. 7).[2] He held in addition the sinecure rectories of Petworth and Fulham.[3]

Considerable though these offices and honors are, they still fail to make out Henry King as the equal of his father.[4] For in Godwin's list of the twenty-one sees of the Province of Canterbury,[5] London stands first, Chichester twelfth. Among the five bishoprics to be filled, in 1641, Chichester always stands fourth.[6] While many Bishops of Chichester have been advanced to more desirable sees, none has ever been translated directly to the Archbishopric of Canterbury or York.[7] And finally, Hannah shows[8] (without, however, drawing the unfavorable inference which seems unavoidable) that even for this relatively unimportant see King was only a substitute or second-best, appointed late and consecrated some months after the first of the five vacancies had been filled; and even so, if Fuller is to be trusted, King owed his selection in large part to the merits of his "pious and popular father."[9] In short, we must ascribe Henry King's inclusion in, for instance, the Encyclopaedia Britannica, XIth Edition, while his father is excluded, not to any supereminence over John King in their life-times,[10] but solely to the volume of poems which has been the occasion of the present undertaking.

When subjected to comparison with his father in another respect, Henry King does not fare so badly, and strangely enough this is the

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[1] Clarendon ("Hist. of the Rebellion," ed. Macray, 1888, vol. I, Book IV, p. 401) calls King "Dean of Litchfield"; but this is mere inadvertence, presumably, for King's name does not appear among the Deans of Lichfield listed by Le Neve (I, 563).

[2] "Alum. West.," 77; "Athen. Oxon.," III, 839. [Hannah (xxxix) shows that the date of consecration was Feb. 6, 1642.]

[3] "Alum. West.," *ibid.* [4] Cf. pp. 227 and 231, sup.

[5] "Catalogue of the Bishops of England since the first planting of Christian Religion," etc., London, 1615.

[6] Fuller's "Church History," VI, 236; Clarendon's "History of the Rebellion," I, 401; etc.

[7] Le Neve, I, 238—55. [8] xli—xlvi. [9] Fuller, *ibid.*

[10] Both had various books dedicated to them, so that no satisfactory test is afforded thereby. Cf. Madan's "Early Oxford Press," 1895, pp. 78, 88, and 90; "Athen. Oxon.," I, 761; II, 295 n.; III, 923; "Fasti Oxon.," II, 214; "N. & Q.," 2d Series, IX, 432, 492; Brydges' "Censura Literaria," 1807, III, 272.

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point on which John King was most highly praised. The opening clause of Wood's summary, adapted from Fuller, has been given above,[1] and the citation may now be completed: "When he was elder, he [Henry King] applied himself to oratory and philosophy, and in his reduced age fixed on divinity; in which faculty he became eminent, as his sermons partly shew, which remained fresh in the minds of his auditors many years after his death."[2] While King's reference to his "course in study" in Letter I, below,[3] perhaps justifies the statement about his application to philosophy, the relegation of "divinity" to his old age is absurd, for a letter quoted by Nichols[4] shows that his first sermon was delivered in 1617, before he was 26 years old, and the Bibliography of his theological works is an added overwhelming refutation.[5] The verdict passed on his first sermon was this: "He did reasonably well, but nothing extraordinary, nor near his father, being rather slow of utterance, and *orator parum vehemens.*"[6] This criticism supplies another explanation for his failure to be appointed Public Orator of the University during his college career,[7] and indicates that his abilities were slow in maturing. But if he did not equal his father in pulpit effectiveness, in the judgment of his contemporaries (though Wood says that he "became a most florid preacher"[8]), at least posterity will to some extent justify Fuller's encomium by preferring Henry King's sermons to John King's, considered as literary productions. The son is less ponderous, more incisive, more vital, though the two are very closely alike in style, in method, and in attitude.

In support of Henry King's pretensions as preacher, a few notable passages may be instanced. In the sermon vindicating his father's orthodoxy (Nov. 25, 1621), there is a fine passage on p. 9, beginning: "The words of dying men are precious even to strangers; but when the voyce of one we love, cals to us from the death-bed," etc. Other fine portions of the same sermon are the paragraph on Persecution by slander, pp. 45–7; the two paragraphs of transition to the subject of his personal loss, p. 49; and the restrained but moving description of his father's last hours, pp. 62–73, with the admirably dignified and appealing peroration, pp. 74–77. Nor are there wanting happy touches in detail, such as—"We are but Impes and

[1] p. 233, footnote 3.

[2] At the close Wood greatly moderates the extravagant laudation of the good Fuller, who asserts that King's sermons "will report him to all posterity."

[3] Appendix B, p. 287. [4] Op. cit., III, 445. [5] pp. 275–77, inf.

[6] Nichols, *ibid.* [7] p. 223, sup. [8] "Athen. Oxon.," III, 839.

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Zanies, in respect of those that lived in the Primitive Church"; or—"No more have those once glorious dayes, now any difference in our memory or esteeme. They lie promiscuously raked up in the dust of time, without any monument set over them, to tell they once were: no Rubrick, or capitall letter inserted, to distinguish them from the common heape of dayes piled up in the Almanacke." Again, in his Lenten Sermon at Whitehall (Mar. 3, 1626), pp. 11–13, the paragraph on the testimony of creation to the truth that the hand that made it is divine, is rather a splendid "purple patch." Again, in his Spital Sermon (Easter Monday, 1626), pp. 2–5, there is a striking paragraph on "He," beginning: "It is no flat or low expression to discipher God by a Pronoune rather than a Name, but the most eminent forme of speech that may be." His Inauguration Anniversary sermon (Mar. 27, 1640) is analyzed below,[1] and his funeral sermon over Bishop Duppa (Apr. 24, 1662) has been commended above[2] and is quoted below.[3] So, finally, but one more need be mentioned, as a specimen of his latest work, namely the Anniversary sermon in commemoration of King Charles' martyrdom (Jan. 30, 1665). Now it was apparently mandatory, well into the Eighteenth Century, that this subject be treated every year on this date, in every pulpit,[4] and hence it is not to be wondered at that all natural and proper ideas or expressions were soon exhausted and nothing remained except repetition or exaggeration; but Henry King's sermon is free from these blemishes, and in depth, power, and conviction is far above the hollow rhetorical extravagances or dull commonplaces of the various other sermons on this subject examined for purposes of comparison.[5] In general it must of course be frankly admitted that he is not capable of supreme flights of oratory; but at his best he is dignified and impressive, frequently trenchant, and at intervals soberly eloquent.

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[1] p. 259.

[2] p. 243, sup.; this sermon shows marked distinction and forceful solemnity throughout, quite in the "grand manner," with at least one passage (on the "Pretiousness" of Death) in a really exalted strain of true though formal eloquence. It was preached "to the great content of the auditory." ("Athen. Oxon.," III, 543).

[3] pp. 256, 257.

[4] An examination of numerous collections of Sermons, in the Bodleian, for the period 1660–1730, leads to this conclusion.

[5] Pepys, ed. H. B. Wheatley, 1892, makes the following spiteful comment on this sermon, under date of Mar. 12, 1665; "I sat down and read over the Bishop of Chichester's sermon upon the anniversary of the King's death, much cried up, but, methinks, what a mean sermon." This sermon contains

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King's sermons are doubly important to any student of his life because of the light they cast on the vexed question of his religious opinions, the one blot on his record which must if possible be removed before his biography can be fairly closed; for a last comparison with his father is suggested by the charge of heterodoxy also brought against Henry King, also posthumously, but unhappily not refuted by filial piety in this case. The trouble seems to have been started, or, at least, first stated, by Anthony à Wood, in his closing remarks about Henry King:[1] "What remains to be observ'd of this prelate is, that he was always puritanically affected, and therefore to please the puritans he was promoted to the see of Chichester . . . That being not removed to a better see [i. e., after the Restoration], became discontented, as I have heard, and a favorer thereupon of the presbyterians in his diocese." This charge alone does not carry much weight (though it has been repeated by practically every biographer since its first appearance),[2] for Wood's malicious and scandalous thrusts have considerably discredited his great work,[3] even from the very first.[4] Walker, who incorporated Wood's charges into his own text[5] (though with a kind of reservation, already cited in another connection,[6] and to be mentioned again presently), was thus rebuked by some friendly critic who was apparently reading his proof for him:[7] "Tho' there be an air of impartiality throughout your whole

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the curious fling at the blind Milton, on p. 34:—"One of them [i. e., one of the "infamous Raylours, whom the Proud Faction kept in pay"], and indeed the most Malicious in the Pack, who calls himself *Iconoclastes*, so shamelessly rails, That as St. *Paul* said to *Simon Magnus*, so might I to him, *Thou art in the Gall of Bitterness*: And as the Apostle charged *Elymas* the Sorcerer for *Mischief* and *perverting the Truth*; so it is very memorable This Wretch had the fate of *Elymas*, *Strook with Blindness* to his Death." It is also interesting as emphasizing Henry King's firm belief in the royal authorship of "Eikon Basilike."

[1] "Athen. Oxon.," III, 841.

[2] Hannah (l, footnote) very neatly shows how Wood himself contradicts his own charge; for he speaks ("Athen. Oxon.," III, 703) of Cheynell's succession to "the rich parsonage of Petworth in Sussex, in the place of an honest and loyal doctor ejected thence." This "honest and loyal doctor" was the supposedly "puritanically affected" Henry King!

[3] E. g., "Dict. Nat. Biog.," lxii, 351; "Wood was himself fond of severe reflections, and all through his work had adopted reckless charges and criticisms from spiteful correspondents"; and cf. pp. 350, 351, pas.

[4] "Wood's Life and Times," ed. A. Clark, 1894, III, 365—496; also "Fasti Oxon.," I, 379, N. 1.

[5] Op. cit., II, 11, 12.

[6] p. 240, sup.

[7] "Dr. John Walker and 'The Sufferings of the Clergy,'" by G. B. Tatham, 1911, 248.

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work, which is very becoming an Historian, yet, methinks, you carry the matter too far sometimes both in being over severe to your Friends & too favourable to your enemies. Sometimes you appear too severe to your Friends, as pticularly, . . . in your Reflections on Bp. King (Chichester), . . . and some others. I know not what obligation you are under to discover the Infirmities of these, who were some of them very good & great men. And perhaps all the grounds you have for reflecting on some of them, may be some foolish stories told by An. Wood, whose Cynical temper prompted him to say the worst he could of Every Body, for which he has been so often & so justly condemned." So, some twenty-two years after the appearance of Wood's charge, here is a vigorous protest against according it any weight,—or, at least, an interesting impeachment of Wood's authority in general. However, this slander, if slander it was, was deeply rooted and persistent, for the present writer found the tradition flourishing in Chichester, in January, 1912, where a venerable verger, encountered in the Cathedral, vouchsafed the information that Bishop Henry King, still remembered as "the Bishop during the siege," had been strongly in sympathy with the Puritans and Puritanism, and yet was very severely handled by the Puritans after the capture of Chichester. So a brief examination of facts and documents on both sides must be undertaken.

Some few points in King's life seem to justify the charge, at first sight. On one occasion in Parliament it was expressly asserted that "there can be no superstition proved upon the Bishop of Chichester,"[1] as if he were notoriously low church in his views. And a bit of evidence in support of the contention that the general parliamentary or Puritan opinion of him was favorable is perhaps the fact that he was not included in Col. John White's scurrilous black-list entitled "The First Century of Scandalous, Malignant Priests. . . . Or, A Narration of the Causes for which the Parliament hath Ordered the Sequestration of the Benefices of several Ministers," published Nov. 19, 1643. Again, there is a possible taint of Puritanism in some of his poetry.[2] Further, he was, it is quite true, promoted to the Bishopric at a most dangerous juncture when a compromise candidate was the only safe appointee, one "generally beloved by all disengaged people," as Fuller phrases it.[3] And finally, and this is the one really

[1] "Sussex Archaeological Collections," 1852, V, 50.

[2] Cf. "Being waked out of my sleep by a snuff of Candle," "Sic Vita," "My Midnight Meditation," and "The Dirge."

[3] "Worthies," I, 202.

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damaging point against him, he assuredly was not advanced to a more desirable see, at the Restoration,[1] whereas his successor, Peter Gunning, was translated in 1674 to the see of Ely, "with a particular acknowledgment from his majesty of his steadiness to the church, having kept up the face thereof in the worst of times."[2]

The last point remains inexplicable and unanswerable, so far as available informations goes, unless we are gratuitously to suppose a personal enmity between King and William Juxon, Bishop of London and in 1660 Archbishop of Canterbury;[3] but after the other three points in support of the charge of Puritanism have been offset, it is believed that sufficient positive evidence can be brought forward to establish King's orthodoxy even in the teeth of this single unanswered objection. As for the first point, then, King's low-church reputation did not save him, and neither his repeated special petition nor the terms agreed upon with Sir W. Waller previously to the surrender of Chichester could alter "the ordinance of sequestration" passed upon him, June 6, 1643.[4] And here should be quoted Walker's quasi-reservation or protest, mentioned above, for he adopted Wood's charge,—"Though he was always Esteemed to be Puritanically Affected, and was Promoted to this Bishoprick to please that Party," —with this irreconcilable qualification: "yet when the Rebellion broke out, he was most Barbarously treated by them; nor was he suffered to live quietly," etc.; and this qualification has been repeated with the charge, by practically all the biographers.[5] This barbarous maltreatment has been so commonly reported as to need but little emphasis here: witness his Will,[6] his Letter to Mr. Bysshe,[7] and Wal-

[1] This is particularly ominous, because Juxon, who twice might have favored King (at his delayed appointment, in 1641—2 [Hannah, xlii], and at the Restoration) and each time apparently disapproved, was a special protege of Laud's ("Athen. Oxon.," IV, 818).

[2] "Athen. Oxon.," IV, 143.

[3] Le Neve, I, 27. King's relations with Juxon's successor, Gilbert Sheldon, do not seem to have been altogether pleasant: cf. Letters 3 and 4, Appendix B, and Letters mentioned in Bibliog., p. 280, inf.

[4] "Sussex Arch. Coll.," *ibid.*

[5] Cf. statement of verger, in 1912; p. 253, sup.

[6] "Later supplyes of competence . . . . were allmost totally consumed [by] Publick calamitie or private iniurie suffered in these days of discention." "My bookes, being now a small remainder of a large liberary taken from me at Chichester, contrary to the condiĉon and contracte of the Generall and Counsell of warre, at the taking of that Cittie." "During my misfortunes since the losse of all I had at Chichester." Etc.—Hannah, cviii—cxiv.

[7] Appendix B, Letter 1.

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ker's conjecture as to his having been supported by charity;[1] and consult any detailed account of the siege and capture of Chichester.[2] The negative testimony, of King's exclusion from Col. John White's "Century of Malignant Priests,"[3] is overborne by the virulent attacks of that rabid Puritan, John Vicars: "Bishop King, as bad as the worst";[4] "Dr. King also, then Bishop of Chichester (a proud Prelate, as all the rest are, and a most pragmaticall Malignant against the Parliament, as all his cater-capt companions also are)."[5] As for King's poetry, there is plenty of orthodox ecclesiasticism there; the two elegies on King Charles are just two long and fiery condemnations of the Puritans.[6] And finally, if, in his promotion to a Bishopric in 1641–2, there was need of avoiding the giving of offence to parliamentarians and Puritans, surely there was at least equal need of appointing a man whose loyalty to the tottering Church and Monarchy could be relied upon; Hannah[7] quotes the evidence demonstrating the validity of this hypothesis, but fails to draw the inference, in this excerpt from a Letter from King Charles to William Juxon, Bishop of London, relative to the five appointees for the vacant Bishoprics: "I have altered somewhat frome my former thoughts, to satisfie the tymes, & *yet I hope that I have not disserved my selfe in my elections.*" Henry King's appointment as chaplain to King Charles as well as to King James,[8] his preferments in the Church,[9] the royal bestowal of Petworth upon him after his consecration as Bishop,[10] his dedication of his "Exposition upon the Lords Prayer,"[11] and his two elegies on King Charles, all go to show that he stood high in his royal master's favor and was deservedly "one of those persons of unblemished reputation that his majesty, tho' late, promoted to that honourable office."[12]

Aside from these fairly satisfactory evidences of orthodoxy, six further positive indications remain to be noted. (1) Sir John Monson, who "suffered much for his loyalty" ("Fasti Oxon.", II, 40) during the Civil War, dedicated to Henry King his "Antidote against

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[1] pp. 240, and 242 Note 1, sup.

[2] "Sussex Arch. Coll.," V, 43–51; XXXI, 205–8; "Victoria Hist. Sussex," I, 522.

[3] Note that this was only "The *First* Century": others were to have followed.

[4] "England's Worthies," 1845, p. 78.

[5] "Jehovah-Jireh," 1644, p. 239.

[6] The lines to Sandys and the Lucas-Lisle elegy are equally unequivocal.

[7] xlii, xliii. [8] p. 249, sup. [9] *Ibid.*

[10] Hannah, xlix, l. [11] Bibliog., p. 277, inf. [12] "Athen. Oxon.," III, 839.

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the Errors of Opinions of Many in their Days, concerning some of the highest and chiefest Duties of Religion, viz. Adoration, Almes, Fasting and Prayer," 1647 (republished 1661–2). That this work was anti-Puritan in tone is avouched by Monson's whole life (for though some of his publications savor more of toleration than of sectarian partisanship, still Laud spoke very well of him; cf. Laud's "Works," 1857, VI, 82, and VII, 225; furthermore, he was severely handled by the Puritans) and especially by the fact that it was published anonymously and dedicated by means of a private monogram, only. (Cf. p. 242, footnote 1, sup., and p. 270, inf.). (2) King's favorite patristic authority was "Nazianzen," or Gregory of Nazianzus, one of the four great Fathers of the Eastern Church. Now this Gregory's chief claim to greatness lies in his defence of Athanasianism and the Nicene Creed against Arianism,[1] at Constantinople about the year 380,[2] and in his famous five discourses on the Trinity directed especially against the Eunomians and Macedonians.[3] Surely this particular Father would be one of the first to commend himself to an enthusiastic Church of England man, and one of the last to appeal to a Puritan. (3) The friendship and repeated commendations of Izaak Walton would hardly have been accorded to one weak in the faith. (4) First through his intimacy with Bishop Duppa and then by the exiled Charles II's own appointment, he played an important part in some efforts made to prevent the threatened extinction of episcopacy or rupture of the apostolic succession, as the following quotations from pp. 41–43 of his funeral sermon over Brian Duppa, in 1662, show; and though he testifies in his own behalf here, the public nature of the occasion made it absolutely impossible for him to attempt any mis-statement or deception: "He [Duppa] was alwaies so faithfull to *God* in the service of *His Church* wherein He liv'd, that He never receded from His first Principles in any slackness either towards Hir *Doctrine* or Hir *Discipline*. Insomuch that His Sacred Majesty desirous to preserve the Succession of His *English Church*, & sensible of His *Bishops* Decay, Most whereof were Dead, & Those Few who remaind not likely to last long, was pleas'd to commit this Trust principally to His Solicitation. In discharge whereof how industrious He was, some who yet live know, and none better than My self, who was His only associate in several travels undertaken to bring it to effect.

[1] Cf. pp. 229–30, sup.

[2] "Cyclo. Bibl. Lit.," 1870, III, 994.

[3] "Encyclo. Brit.," XIth Ed., XII, 563.

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"'Tis true, divers waies were propounded, yet all found dangerous, Under the Inquisition we then liv'd, both to the Undertakers and the Actors.

"His Majesty therefore at last thought of a safer & more certain Expedient, to call over to Him Two of the remayning Bishops, who joyned to a worthy Praelate residing with Him in His Exile might Canonically Consecrate some of Those eminently deserving Divines who then attended Him; Thus Preserving the Order in a Few, untill God gave opportunity to fill up the other Vacancies.

"This desire was by a trusty Messenger sent over by His Majesty communicated only to Five; whereof (I shall *not Magnifie my Office* to say) My self was One, who in the integrity of my Conscience can profess that in the willing acceptance of this Summons I never declin'd any hazard when I might doe the King my Master or the Church Service. But great Age and greater Infirmity denying the concurrence of any One of the Rest (though otherwise most ready) that designe fell: And God hath in the Miraculous Restoration of His Sacred Majesty Restor'd the Church to that Luster wherein (blessed be His Name) you now see it.

"He in whose presence I here stand bears me record, I mention not these Circumstances to any other End than my Soveraign's Honour; For it is not fit so meritorious an Act should be conceal'd and smothered, but that all might take notice how Carefull He was to Preserve and Support the Church, at that Time when in His Exil'd condition He could not well Support Himself." This was dangerous service, with no prospect of reward, and none but a staunch Anglican would have undertaken it. Furthermore, Hannah (lxiii) records the fact that in 1657 King actually ordained a minister, despite the Protectorate's enactment forbidding it. (5) Henry King's Will, dated July 14, 1653, and probated in the same form at his death in 1669, would naturally express his solemn conviction stated as in the sight of God when all concern for this world had been laid aside; and yet in 1653, when Puritanism was flourishing without any conceivable likelihood of overthrow, this was what he set down of his religious beliefs:[1] "I was bred up in the reformed Protestant Church of England,[2] wherein, as by his vouchsafed goodnes I was an vnworthy

[1] Taken from Hannah's copy of the certified transcript, cviii, cix.

[2] The almost bigoted orthodoxy of John King must have affected his son, and traces of influence are not wanting. Nazianzen was a favorite with the elder King (cf. Manningham's Diary, 71, and Nichol's Commentaries, 321); his ecclesiasticism is the pattern for his son's (Nichol, 327 ff.); and

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minister, and after, through the benignitie of my most royall Master, King Charles the First, advanced to the highest order in the Church of Chichester, soe I professe my selfe to dye a sincere member of the English Church, confessing in my last breath, that shee, as well for the purity of her doctrine as the decencie of her ceremonies and discipline, in neither of which suffered any Tainte for those malignant extreames of Popery or Puritanisme, was the most Orthodox, and, untill these unfortunate tymes darkened her lustre, the happiest Church that, since the Apostles dayes, the Christian world hath knowne." Now there was no reason for his making any such declaration unless he strongly believed it. For his own sake and for his heirs' sakes, it would have been far more politic simply to avoid any mention of religion at all so long as he could not conscientiously profess Presbyterianism. The same sort of testimony is afforded by the last paragraph of the Preface to his version of the Psalms. (6) Finally, his sermons betray no trace of Puritan doctrine. Here, if anywhere, he might be expected to reveal the opinions which he is supposed to have cherished, but nowhere is he other than vehemently hostile to Puritanism. At two Periods in his life, especially, has he been taxed with heterodoxy, (a) after the Restoration, when his discontent over his failure to receive promotion was alleged as reason for his disaffection, and (b) shortly before his elevation to the see of Chichester, when his selection was alleged to have been due to his Puritanical leanings. But, on the contrary, these are the facts: (a) In the sermon on Duppa, 1662, he vigorously denounced the Puritans, pp. 19—21, 26—28, while on p. 13 this sentence appears: "Indeed the World is now in it's Dotage Creepled and Bed-rid, In the last and worst Age: So that had it not some few sound Crutches to support it, some few Pillars [i. e., loyal Bishops] not eaten in by the vices of the Time, nor Canker'd by those Opinions which madly fly about, not only to the disfiguring our Churches *Decency* and *Order*, but the shaking and undermining even Her *Fundamental Truths*, It could not subsist." His Visitation Sermon, Oct. 8, 1662, is one long plea for seemliness and the proprieties; in Church services and in questions of faith or doctrine, "Let all things be done decently and in order," is his repeated exhortation. So there is no shadow of justification for Wood's charge, here. The paragraph on Milton, also, shows no sympathy for Puritans in 1665.[1] (b) The charge based on his supposed attitude before his election to the Bishopric is equally groundless, as is proved by the following synopsis of his Inauguration

several of Henry King's most vigorously pro-Anglican poems show indebtedness to John King's sermons.

[1] Cf. p. 251, N. 5, sup.

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Anniversary sermon, delivered March 27, 1640; this is the sermon which Hannah was unable[1] to find a copy of, and his regret was very proper, for had he been able to examine this sermon he must have arrived at the conclusion here asserted, that it definitely overthrows and nullifies Wood's often-quoted charge. It may be briefly summarized as follows: pp. 1–10, an extreme, almost violent, vindication of the Divine Right of Kings—with incidental thrusts at Papists and Nonconformists; 11–19, a vigorous justification of absolute Monarchy; 20–29, an energetic assertion of a King's superiority to both Papacy and Presbytery, with praise of an Established National Church whose head is the King; 29–38, a glorification of a King's duties and powers, as against the people's rights—with some harsh words for Knox, Puritanism, and Jesuitism;[2] 38–41, a vivid picture of the evils of rebellion and anarchy, "whiles they goe about to whelme the Kingdome over the King" and "Everyman did what was good in his own eyes" (these pages, like many others in this sermon, were singularly prophetic); 42–59, a eulogy of Charles I as the wise head of the Church, dispenser of Justice, rebuilder of St. Paul's, founder of the Royal Navy, and noble example of piety—with excursus, 44–47, on the purity and true Apostolic succession of the English Church. To tax the author of this sermon with Puritanical leanings is a mere meaningless absurdity; for if he was so consummate a hypocrite and liar as to cherish Presbyterian beliefs in spite of his language here, how could he ever have betrayed those beliefs in such a way as to make them "generally" known?

To sum up, then, an examination of all the evidence produces so overwhelming a sense of probability as to amount to absolute certitude that Henry King was perfectly and literally orthodox. His sermons, his religious verse, and his life unite in proving him a staunch upholder of Anglican doctrine. His instinct was all for system, establishment, orthodoxy. He was a sound adherent of organization—exalting the Letter above the Spirit, assent above conviction—one whose religion was ecclesiasticism: the Church *qua* Institution, the Bible *qua* Clerical Code of Law. In short, so far was he from any taint of nonconformity that it is almost just to say of him that he was more a Churchman than a Christian.

This sketch of Henry King's biography clearly shows that no extravagant claims can be made on his behalf. He was not one

[1] pp. xlix, cxxv.

[2] On p. 34 occurs this pithy declaration: "The Schismatick is a Thorne in the sides of the Church, the factious a Thistle in the State."

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of the dominating personalities of his age. But his associations with greater men, such as Donne, Walton, and Hooker, his relation to "Eikon Basilike" and the preservation of Episcopacy, together with the light which his experiences cast upon the inner history of these stirring times, make him a figure not to be overlooked by any student of the period. His chief interest and importance to-day, however, are undoubtedly due to his literary productions; he is admirably fitted to stand as the representative of the little known but numberless and characteristic minor writers of the seventeenth century, and it is from this point of view that the accompanying somewhat detailed Bibliography has been prepared and is herewith presented.

BIBLIOGRAPHICAL SUMMARY OF HENRY KING'S WRITINGS

PART ONE: MANUSCRIPTS.

I. COLLECTED POEMS.

1. Malone MS. 22, in the Bodleian. This is a well preserved little volume, in fine clear script. King's poems fill ff. 4–45v; on fol. 1, in a later hand, are various ascriptions to "Dr: H: King"; ff. 2v and 46 contain nonsense and doggerel fragments, in different hands; and scattered throughout are curious comments apparently written by the early suffragist who defiantly subscribed her name, "Eliz. Dottin Her Book," immediately beneath her departed husband's (?) "Henry Dottin His Book," on fol. 3. The doggerel on fol. 2v is violently anti-matrimonial, and those of the comments that are not fatuous banalities have an unctuous feminist tone. The comments are written in French, by one quite ignorant of the language, who seemingly culled the words from a Glossary one by one with total disregard for syntax and inflection. For instance, after the Epigram at the botton of fol. 31v.,[1] is written this edifying sentiment: "La femme qui voudriez aimez Elle ne scauriez dire que Elle aimez"; while after the next two poems are inscribed these illuminating comments: "Nous [query: sc. "ne . . . pas" ?] devez croyez tout qui nous entendré," and, "un Chanson pour un L'amour que peut le trover."—This MS. volume contains fifty-six of the seventy-three

[1] "I would not in my love too soone prevaile:
An easy Conquest makes the purchase stale."
—After Petronius' "Satyricon," Cap. 15.

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poems included in the *editio princeps*, and five new poems or new versions. It is evidently an early compilation, for no piece is included that can be dated after 1633, and some of the pieces are evidently earlier versions of the finished poems printed in 1657.

2. "A MS. copy in the possession of Mr. Pickering," or "the larger MS. volume." This is the MS. with which Hannah collated his Edition of King's poems, in 1843. If Hannah's account of it is correct and complete, it contained sixty of the seventy-three poems printed in 1657, one of the four added in 1664, and six others as well as a MS. sermon (cf. p. 283, inf.). This collection is certainly later than the Malone MS. vol., for it includes several poems that can be definitely dated in 1637 or later; the latest of all was added in a different hand, according to Hannah (lxi, footnote), and so need not affect the earlier date of the rest. Certain poems belonging in the 1640's, however, are missing, and there are the same early versions of certain others; so, though later in date than the Malone MS. vol., this collection too must have been made some fifteen years before the *editio princeps* appeared. This invaluable MS. has disappeared; and its recovery seems hopeless, for the exhaustive efforts that have been made to bring it to light have proved vain. This laborious investigation produced only one promising result; for, finally, an appeal in "N. & Q.", XI S., v. V, p. 468, brought a response in XI S., v. VI, p. 32, which gave an apparently hopeful clue: a MS. volume of King's poems, there described, was said to have been sold at Sotheby's rooms Dec. 9, 1900. Two letters to Sotheby produced the curt statement that the catalogue of sales at that period is in the British Museum. A professional copyist looked up the catalogue and found that Dec. 9, 1900, was a Sunday, and researches under Dec. 9 in other years yielded no return. So this tantalizing clue has proved to be worthless, and the *status quo* has been resumed with a second appeal to "N. & Q.", published XI S., v. VIII, p. 189.

3. "King (Henry)? (1591–1669) Poems written between 1610 and 1646, *beautifully written MS.* (166 *pp.*) *bound in blue morocco extra, joints and g. e., small 4to.* 1646. 75 pieces: 2 on Bishop John King." This is the description in "N. & Q.," XI S., v. VI, p. 32. It cannot refer to the particular MS. volume sought for as set forth above, originally owned by Pickering and used by Hannah, for that contained only 67 pieces, according to Hannah's account; and surely so careful an editor as Hannah would not have passed over, without mention, at least *two* poems not elsewhere preserved (for the *editio princeps* contained only 73 pieces), one of them being a new poem about Henry King's father.

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4. (?) It is quite possible that James Howell referred to a fourth collection, in the extract from his letter, referred to on p. 245, sup.; but the point is not susceptible of investigation.

As stated above (Biog., p. 245, N. 3), some other codices might almost be included here; but, on the whole, it seems best to consider them in the following Class.

II. SINGLE POEMS OR SMALL GROUPS.

Inasmuch as this bibliographical sketch is concerned only with Henry King's own writings, and not with the writings of others about him, no attempt has been made to tabulate here *all* the MSS. consulted or cited in the course of the present work. Thus, for example, no mention has been made of the "Historical MSS. Commission Reports," Hunter's MS. "Chorus Vatum," or Bishop Kennet's MS. collections. The following is simply a list of the various MSS. containing versions of one or more of King's poems:[1]

A. The Bodleian Library, Oxford.

Ashmole MSS. 36; 38.
Malone MSS. 16; 21.
Rawlinson MSS. D. 90*; D. 317; D. 398; D. 912; D. 1092; F. 26; F. 84; F. 160; F. 206; F. 213*; Misc. 699*. [MSS. marked by an asterisk contain one or more of the Doubtful Poems, only; i. e., poems where King's authorship is possible or probable, but not reasonably certain.]
Tanner MS. 465*.

B. The Library of Corpus Christi College, Oxford.

C. C. C., Oxon., MSS. clxxvi: 28; cccxxviii: 66 and 70.

C. The British Museum, London.

Additional MSS. 6931; 11,811; 15,227; 17,062; 18,220*; 19,268; 21,433; 22,118; 22,582; 22,588; 22,602; 22,603; 23,229; 25,303; 25,707; 27,408; 30,982; 33,998; 37,717.
Burney MS. 390.
Egerton MSS. 923; 2013; 2421*; 2603*; 2725.
Harleian MSS. 3511; 3910; 6057; 6917; 6918; 6931.
Lansdowne MS. 777.
Sloane MSS. 542; 1446; 1792; 2142*.

[1] Certain MS. Letters, which should properly be listed among the MSS., have been included in Part Two of this Bibliography for the sake of the convenience of considering all King's Letters in a single group; consequently, Part One deals with his Poems alone. (Cf. Note 2, p. 280).

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PART TWO: PRINTED BOOKS.

I. ENGLISH POEMS.

1. "An Elegy Upon the most Incomparable K. Charls the I. Persecuted by two Implacable Factions, Imprisoned by the One, And Murthered by the Other, January 30th 1648."[1] 20 pp.. The poem was subsequently reprinted in small octavo form and bound up with the other additional Elegies in the 1664 re-issue. Lowndes ("Bibl. Manual," 1860, 1273) mentions the sale of a copy of this small quarto pamphlet.

2. "*A DEEPE GROANE FETCH'D AT* the *FUNERALL* of that incomparable and Glorious Monarch, *CHARLES* the First, *King of Great Britaine, France and Ireland,* &c. On whose Sacred Person was acted that execrable, horrid & prodigious Murther, by a trayterous Crew and bloudy Combination at *Westminster, January the* 30. 1648. (Motto). Written by D. H. K. (Device). Printed in the Yeare, M.DC. XL. IX." This poem enjoyed three printings in 1649, the second being ascribed to "I. B." and the third being anonymous. The proof of King's authorship (which Hannah was very reluctant to admit, cxxvii) depends upon Wood's unqualified attribution, upon the numerous contemporaneous MS. ascriptions, and above all upon the internal evidence of style and of parallelism with King's other poems and his Sermons. Several copies of the various editions are preserved in the Bodleian and the British Museum.

3. "POEMS, ELEGIES, PARADOXES, and SONNETS. *London,* Printed by J. G. for *Rich*: *Marriot* and *Hen*: *Herringman,* and sold in St. *Dunstans* Church-yard *Fleet-street,* and at the *New-Exchange.* 1657."

The other two title pages, substituted when the unsold copies were later re-issued,[2] are as follows:

"POEMS, ELEGIES, PARADOXES, And SONETS. (Device) *London,* Printed for *Henry Herringman,* and are to be sold at the *Anchor* in the lower-walk in the *New Exchange.* 1664."

"*Ben Johnson's* POEMS, ELEGIES, PARADOXES, AND SONNETS. (Device). *London*; Printed, and Sold by the Booksellers of *London* and *Westminster,* 1700."

The devices of the last two and the marginal figured borders of all three, are different; and to the copies bearing the 1664 title page,

[1] Dates on the title pages, etc., have been preserved in their printed form, when a direct quotation of the original has been given; otherwise the O. S. reckoning has been modernized, throughout the present work.

[2] Cf. p. 245.

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thirty-eight pages of Additional Elegies are affixed. Otherwise, in all essential matters, all copies are identically the same throughout.

The original volume of King's poems was so "very rare" a century ago that Bliss thought it worth while to add a specimen from it to Wood's account of Henry King;[1] naturally, the book is not less rare to-day, and therefore a brief census of the copies examined in the course of the present investigation may not be unacceptable.

(a) With the 1657 title-page; in the Bodleian Library, at Oxford; shelf-number, Arb. 8⁰ A 16 BS. On the title-page is written in contemporaneous MS., "by Phil: King vid. p. 83." [On page 83 occur the lines "To my Sister Anne King."] This copy is in good condition.

(b) With the 1664 title-page; in the Bodleian; shelf-number, Malone 443. "Edmond Malone" appears in MS. on the fly-leaf, and several textual emendations in MS. occur throughout the book. This is a poor copy: the printing on many pages (especially among the additional Elegies) is badly askew, the ink is badly blotted or blurred on several pages, corners are missing, etc.

(c) With the 1664 title-page; in the Bodleian; shelf-number, Douce K. 6. This copy is in excellent condition.

(d) With the 1657 title-page; in the Library of the British Museum, in London; shelf-number, 1076 b. 13. On the title-page these words are written, in early attempted black-letter script: "by, Dr. Henry King." There are several MS. comments scattered through the volume. This is an exceedingly poor copy: it is much damaged by water throughout, both covers are loose, the pagination is hopelessly awry, and many pages are missing.

(e) With the 1657 title-page; in the British Museum; shelf-number, E. 1656. The volume is bound up with Howell's "Som Sober Inspections made unto the . . . Late-long Parlement," etc., 1655.[2] This is a perfect copy, except for certain depredations in the lower margin committed by book-worms; but in no case is the text injured.

(f) With the 1664 title-page; in the British Museum; shelf-number, 11,623. aa. 26. Many interesting and valuable MS. notes are included in this copy; aside from a lengthy investigation of the identity of the anonymous author, which finally concludes in favor of Henry King, the following are the most striking items: the inscription "Ann Howe King" at the top of the second fly-leaf, verso, with this comment

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[1] "Athen. Oxon.," ed. Bliss, 1815, III, 842—3.

[2] Sidney Lee gives only two dates for this work, viz. first publication in 1653 and re-issue in 1660. ("Dict. Nat. Biog." xxviii, 111.)

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below it in a different hand, "I purchased this Book of Dan. Prime Oxon, it was from the collection of L. Chedworth's ancestors, who were related to the Kings, & the above Ladies name appears in very many of those Books." This copy is beautifully bound (by C. Lewis, as a MS. note informs us), and is in perfect condition.

(g) With the 1664 title-page; in the Library of Yale University, in New Haven; shelf-number, In K582 657b. This copy is in good condition, except for the fact that several marginal printed scholia are defective where the leaves have been evenly cut for binding.

(h) With the 1664 title-page; in the possession of the present writer. This copy contains the bookplate of Francis Edward Freeland;[1] it is in perfect condition, except for the loss of the first blank fly-leaf.

(i) With the 1700 title-page; in the Library of Columbia University, in New York; shelf-number, B823 K58. There are a few MS. notes on the title-page and elsewhere, such as the inscription, "See Westn Book Election 1608"; this is obviously a reference to Welch's "Alumni Westmonasterienses," p. 77. This copy is handsomely bound, and is in perfect condition except for some clipping of the marginal sidenotes.

Three important questions remain to be considered in connection with this edition: the first, in regard to the authorship of the volume, has long since been satisfactorily settled; the second, in regard to the significance of the three different title-pages and dates, is here for the first time fully discussed and demonstrably settled: while the third, in regard to editions other than any now extant, has heretofore received little or no attention.

First, in regard to the authorship, Wood's doubts were soon dismissed,[2] and since his time no one of any importance has ascribed the volume to Philip King.[3] The printing of several of the poems over Henry King's signature in various collections before 1657,[4] together with the testimony of Howell's letter[5] and various MS. ascriptions, as well as the argument based on his signed Sermons,[6] puts the matter beyond the need of any further investigation.[7]

[1] Presumably the "F. E. Freeland, Esq., of Chichester, who favored" Hannah "with many useful communications" (Hannah's Preface, iv), and who was related to the Mr. William Freeland whom the present writer interviewed in Chichester, in 1912.

[2] "Hist. et Antiq. Univ. Oxon.," 1674, 281; "Athen. Oxon.," 1692, II, 308.

[3] Cf. p. 244.

[4] Cf. p. 245, Note 2, sup.

[5] Cf. p. 245 N. 5, sup.

[6] Cf. p. 283 N. 1, inf.

[7] This, of course, refers to the authorship of the volume as a whole. Problems in connection with the authorship of various single poems require special treatment.

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The attribution to Jonson is equally futile and more absurd, in view of the poems entitled "To my Sister Anne King" and "To my dead friend Ben: Johnson."[1]

Secondly, in regard to the question as to whether these three different title-pages and dates represent one edition or three, the evidence is again conclusive. To begin with, one copy has been described ("Bibl. Anglo-Poetica," 183) in which, by a careless oversight, the 1657 title-page was not removed when the spurious 1700 sheet was inserted. Moreover, the prefatory address from "The Publishers to the Author" continues to be signed by the same printers, regardless of the altered announcements on the 1664 and 1700 title-pages. Furthermore, the same typographical errors occur in all (e. g., two pages numbered 139, but none 137; "lad" for "laid," p. 32, line 11), even the slips noted in the original list of "Errata" (and the misprint in that very list itself) remaining uncorrected. And finally, a very minute collation has been made for the present undertaking, with somewhat peculiar results. More than fifty slight mechanical irregularities have been noted, such as the following: "sh" below the line in "Prentiship," 4, line 12; "s" below the line in "Theams," 21, line 3; defective alignment and comma in "loves," 25, line 11; blot in "ill," 28, line 15; defective spacing in "your," 31, line 16; defective "i" in "Ship," title at top of 49; "I" above the line in "Is," 94, line 1; period missing at end of 141, line 18, etc. In these points all copies agree, regardless of their title-page. But the following differences occur, each copy being referred to by the letter assigned to it in the list printed on pages 264–265, above: in the numbering of page 26, the 6 is above the 2 in (a), below in (g) and (i); in the catchword "But," at the bottom of page 39, the "t" is below the line in (a) and (g), above in (i); the "r" in "Through," 72, line 12, is invisible in (a), gone save for a dot in (g), but faintly present in (i); the "st" in "most," 73, line 19, is slightly blotted in (a), clear in (g) and badly blotted in (i); the numbering of page 113 is perfect in (a) and (i), but represented by a single figure 1 in (g); the "l" in "shall," 135, line 21, is above the line in (a) and (i), below in (g); etc. Furthermore, just as many differences will be found between (g) and (h), i. e. between two copies bearing the same title-page, as between (g) and (a) or (g) and (i); e. g., "ill," 28, line 15, is blotted in (g), unblotted in (h); "With," the catch-word at the bottom

[1] For an account of this "clumsy" and "stupid" attempt at deception, cf. "Censura Literaria," 1807, V, 50, or "Bibliotheca Anglo-Poetica," 1815, 183.

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of 141, is blotted in (h), unblotted in (g); "nd" in "And," catch-word at the bottom of 43, defective in (g), perfect in (h); "st" in "most" 73, line 19, blotted in (h), unblotted in (g); numbering of page 113 defective in (g), perfect in (h); etc., etc. In general, the differences are trifling ones—dependent upon the chances of ink and paper and hand-presses, while the identities are striking and conclusive—explicable only on the assumption of a single edition. Minute variations of this sort have been commented upon by Professor George P. Baker in an article on "Some Bibliographical Puzzles in Elizabethan Quartos," printed among the Papers of the Bibliographical Society of America, Vol. IV, 1910; he there argues for the recognition of the existence not only of distinct Versions within a single Edition, but also of individual sub-Versions within a single Version, due to the varying degrees of care with which different compositors replaced defective type. All this may well be true, but it certainly does not follow from some of the evidence which he submits: e. g. "*charge*, comma very faint in C, D: trace only, A: absent, B"; "*Bag*. The stop is faint in A: hardly a trace, C: no trace, B, D." The more natural and probable inference to be drawn from such data, and from the similarly minute variations just recorded above, surely is that the printing presses of those days were far from perfect and hence the copies of a single Version might well exhibit such slight differences as these owing to the mere looseness of the mechanical operation. At any rate, neither separate Editions nor distinct Versions can be claimed for Henry King's volume of poems, on the basis of such evidence.

Thirdly, the question as to whether there were ever any other editions of King's poems, no longer extant, or at least no longer generally known, deserves more attention than it has yet received, for the existence of such editions would go far toward proving that Henry King was not so totally unappreciated and neglected in his own day as his later biographers and critics have been prone to assume.[1] There are three pieces of evidence here: (I) the statement of the Publishers about "the present attempts of others" and "their false copies of these Poems"; (II) Park's statement ("Cens. Lit.", V, 51) corroborated by Lowndes ("Bibliographer's Manual," Bohn's ed., 1864, III, 1273), to the effect that "To some copies of bishop King's poems are affixed elegies on his death"; and (III) this specific statement, hitherto unnoticed, by one of the MS. annotators in copy

[1] Cf. p. 245, sup.

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(f) listed above:[1] "I have had anor [another] Edit. of this Book, in wh there are neither Paradoxes or Sonets." While various theories may be advanced to explain away these statements, taken singly, it is here contended that taken together they fairly establish a reasonable possibility that some edition of King's poems has been printed, other than any now generally known to exist.[2]

4. "POEMS and PSALMS by Henry King D D sometime lord bishop of chichester edited by Rev J Hannah BA fellow of lincoln college MDCCCXLIII Oxford: Francis Macpherson London: William Pickering." iv + cxxx + 223 pp. This is the standard critical edition of King's work, so far as it goes, and will always remain a noble monument to its editor's scholarship and an invaluable assistance to the student in its field. Unfortunately, it is not complete; and Hannah's promise on the first page of his Preface, "the remainder of these Poems must be left for a separate volume, which will be published without delay," was never fulfilled.[3] It is perhaps worth noting that this was the second time that King had been balked of a promised complete editing, for Park explains ("Cens. Lit.", V, 51) that he refrains from copious quotation "as an entire republication is intended by Mr. Gilchrist." A third such intention, as yet unfulfilled, is Professor Saintsbury's ("Camb. Hist. Eng. Lit.," 1911, VII, 467). Hannah's edition is out of print to-day and is not easily to be obtained.[4]

[1] pp. 264—5; this MS. scholiast shows himself, in other notes, too well versed in matters bibliographical to be dismissed as a mere irresponsible blunderer.

[2] Wood ("Athen. Oxon.," III, 841) makes this further statement about English poetry by King: "Dr. Henry King hath compos'd several anthems, one of which, for the time of Lent, beginning thus, *Hearken O God*, &c. was composed to music by Dr. John Wilson, gentleman of his majesty's chappel." This "anthem" appears on p. 139 of "Poems, Elegies, Paradoxes, and Sonets." Consequently, the others of these "several anthems" were probably included in the same volume (e. g., at p. 147); or else, Wood was referring to the additions to King's psalter (p. 270, inf.) among which this "Hearken O God" first appeared, or to the paraphrases of Psalms CXXIV and CXXX appended to the stricter versions in his psalter. But there is, perhaps, a bare possibility that there really were "several" other "anthems" by Henry King which have disappeared with this mysterious other edition.

[3] Grosart (op. cit., p. v) somewhat querulously calls Hannah's work an "erudite but provokingly fragmentary edition of a true poet."

[4] Of the present writer's three copies, one, which has been deposited in the Library of Yale University, bears this autograph presentation inscription: "Rev. M. Pattison with the editors' thanks."

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5. "The Exequy and Other Poems, by Henry King, D.D." Published by Thomas B. Mosher, Portland, Maine, in "The Bibelot" for March, 1897, Vol. III, No. 3, IV + 26 pp. But ten poems are included, with a reprint of Hannah's nine extra stanzas on the model of "Sic Vita" and the previously unnoticed variant from "Britannia's Pastorals." Small 4to, in paper covers.

6. "*JOHN DONNE* Selected Poems *HENRY KING* Elegies, etc. *IZAAK WALTON* Verse-Remains." Published by J. R. Tutin, Cottingham near Hull, in "The Orinda Booklets," V, 1904. 63 pp., 16 of which are devoted to King; 12 poems are included. Small 8vo, bound in paper or cloth.

II. METRICAL VERSION OF THE PSALMS.

1. "The Psalmes of David from the New Translation of the Bible, Turned into Meter. To be sung after the Old Tunes used in ye Churches. *Sing Unto the Lord a New Song* Psal: 96: 1. London printed by Ed: Griffin. 1651." This title-page, finely engraved by Vaughan, was supplemented in the original edition by a second printed title-page to this effect: "The Psalmes of David, From The New Translation of the Bible Turned into Meter: To be Sung after the Old Tunes used in the Churches. Greg. Nazianz. Orat. 40. In Baptismo.[1] Ἡ ψαλμῳδία μεθ' ἧ δεχθήσῃ, τῆς ἐκεῖθεν ὑμνῳδίας προοίμιον. *Psalmorum Cantillatio, cum quâ accipiêris, illius Hymnodiae praeludium, &c.* Hippolyt. Episcop. Orat. de Consummat. Mundi, ex versione Jo. Pici. *Temporibus Antichristi Psalmorum decantatio cessabit.* London, Printed by Ed. Griffin, and are to be sold by Humphrey Moseley, at the Princes Armes in St. Pauls Church-yard. 1651." On the back of this sheet appears the formal sanction of the licenser: "Jan. the 7th 1650. Imprimatur. John Downame. Allowed of by the Company of Stationers." Preface, 3 unpaged leaves; text 237[2] pp.; followed by three additional unpaged leaves, containing several hymn-tunes, and a list of errata, entitled: "Some Errours of the Presse are thus amended." 12 mo.

In the British Museum copy (shelf-number, E. 1280) and the two Bodleian copies (8° F. 2. Th. B.S. [where, incidentally, the engraved title-page *faces* the other, instead of merely preceding it], and 8° P. 28. Th. Seld.) the pagination is strangely awry in this sequence:

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[1] Not "Baptisma," as Hannah prints it.

[2] The statement in "Bibl. Anglo-Poetica," p. 446, assigning to this edition "pp. 302" is a mystery—if it be not a blunder.

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168, 169, 166, 167, 172, 173, 170, 171, 176, 177, 174, 175, 180, 181, 178, 179, 184, 185, 182, 183, 188, 189, 186, 187, 192, 193, etc. Regardless of this confusion, however, the text runs right along, in proper order; even the page-headings are undisturbed. The only slip is at the bottom of p. 181, where the catch-word is given as "Psal. cii" when it should be "Psal. xcvii." This error, however, is not due to the faulty pagination, inasmuch as on no page would such a catch-word be correct; for Psalme cii begins in the middle of a page, viz. 188. At p. 107, the page-heading is printed "Psalme xli" instead of "Psalme lxi." In addition to overlooking these various peculiarities, Hannah failed to notice that there are two versions not only of Psalme cxxx, but also of Psalme cxxiv. The Preface was signed only by a monogram, during King's lifetime; but this idiograph seems to have been a recognized means of identification with Henry King, for it appears in some of his autograph letters and in several MS. copies of various single poems, and a book was dedicated to him by means of it,[1] even. This British Museum copy is bound in calf, and on the cover is stamped in gilt: "Gift of G. III."

As in the case of his "Poems, Elegies, Paradoxes, and Sonnets," so here too, after a few years Henry King's work received a new title-page and certain supplementary poems, and was then re-issued as a new edition. The third title-page (which is found *between* the two others, in the copy catalogued 3434. b. 13. in the British Museum) duplicates the second, except for the following additions or emendations: "Unto which are newly added the Lord's Prayer, the Creed, the Ten Commandments, with some other Ancient Hymnes. . . . London, Printed by S. G. and are to be sold by Humphrey Moseley at the Princes Armes in St. Pauls Church-yard. 1654." Among the "other Ancient Hymnes" thus included is a piece subsequently reprinted among the poems in the 1657 volume, on pp. 139–40, namely the above-mentioned[2] "anthem" beginning, "Hearken O God." The hymn-tunes also are supplemented, as well as somewhat changed in order and title; and a new table of "Errata" is added which to some extent enlarges and improves upon the earlier list, but to a greater extent falls short: for some of the "Errours" formerly noted are now disregarded, while none have been corrected in the text. The text, in fact, is unaltered throughout: the faulty pagination between pages 169 and 192, and the other defects described above, remain in the same condition. So the volume, like the "1664" and "1700" copies

[1] Cf. "N. & Q.," 2d Series, IX, 388, 432, 492; "Fasti Oxon.," II, 40, 41; and cf. pp. 242, N. 1, 255, 256, sup.

[2] Cf. p. 268, N. 2, sup.

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of the "Poems", is obviously a re-issue, not a new edition. The British Museum copy is nicely bound in dull claret-colored leather, with marbled fly-leaves, and bears the book-plate of "Henry Francis Lyte"; there are some MS. notes by different hands attributing the volume to Henry King. The various different title-pages, lists of Errata, and extra leaves appear in various unhappy combinations in various copies.

2. A genuine Second Edition appeared in 1671; Henry King's name appears in full on the title-page and at the end of the Preface. The two 1651 and the 1654 title-pages are not included, and there is now a frontispiece[1] presumably due to Playford, since he used it for many others of his publications, viz.: David, in royal robes, seated, with crown and harp and upturned eyes, shone upon by rays inscribed "Gloria Deo": the whole being entitled, "Cantate Domino Canticũ Nouvm Psal 95." But one version (the second) is given of Psalm cxxiv, and but one (the first) of Psalm cxxx. The pagination is correct where it was defective in the earlier printing, but new errors appear in the numbering of page 10 and in this garbled sequence: 224, 223, 218, 219, 220, 221, 222, 223, 224, 225. Consequently, though the last page of the text is numbered 232 and Hannah gives that as the total number of pages included, there are really 240 pages in the text of the Psalms here.[2] Again, the headings of Psalms and Pages are correct where they were faulty before, but new errors of the same sort appear on pp. 36, 71, 90, 91, 216, and 223. The Errata noted before are corrected in this printing, but several new slips appear. This Edition, however, is not so poor a piece of work as Hannah asserts;[3] on the whole, it is an improvement on the other. It is now an octavo. In the British Museum copy (catalogued 3433. b. 20), seven Errata are corrected in ink in the text and recorded in pencil on the rear fly-leaf. Finally, on the half-page below Henry King's signature at the end of the Preface, the following announcement is printed: "Advertisement. There is published newly a book

[1] Unknown to Hannah; his several inaccuracies in describing this edition seem to be due to the fact that he himself never saw a copy (as is implied in his statement on p. cxxx and in his footnote to p. 215) but had to rely upon the Lambeth Palace Librarian's report on the copy in the Archbishop's collection; this copy (catalogued 94. I. 31) happens to be imperfect, furthermore, for the front cover and frontispiece are missing.

[2] The number given in "Bibl. Ang.-Poet.," viz. "pp. 246", evidently includes the Preface and the additional leaves containing "Hymns of the Church."

[3] cxxx.

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Entituled Psalms and Hymns to Solome Musick in Four parts upon the common tunes Used in Parish Churches, wherein is a perfect Direction to[1] the Use of this excellent Translation of Bishop King: which Book is to be Sold by John Playford at his Shop in the Temple." The volume thus advertised Hannah was unable to find;[2] Professor G. H. Palmer, of Harvard University, also sought it in vain, as will presently appear; and as it not only is exceedingly rare, but also really constitutes a third edition of Henry King's psalter (at least, a partial edition or selection), it seems worthy of somewhat detailed description:

3. "Psalms & Hymns in Solemn Musick *of Foure Parts* On the Common Tunes to the *PSALMS* in Metre: Used in Parish Churches. *Also Six HYMNS for One Voyce to the ORGAN* For God is King of all the Earth, Sing ye Praises with Understanding, Psal. 47.7. By John Playford. (Device: miniature of frontispiece described above,[3] set in a musical border or margin.) *London,* Printed by *W. Godbid* for *J. Playford,* at his Shop in the Inner-Temple. 1671." The title-page is preceded by "A Hymn on the Divine Use of Musick," unsigned, and followed by Playford's Dedication "To the Reverend, Learned and Pious William Sancroft, Doctor in Divinity, and Dean of St. Pauls London:" On the three following (unnumbered) pages is printed "The Preface," in which traces of King's own "Preface"[4] and of Fuller[5] are evident. The last two paragraphs here alone concern us: "*Many have attempted it* [*i. e. rendering the Psalms*] *by their more refin'd translations, but as yet none of them received into publick use; amongst which, Two lately published, viz. one by the Right Reverend Pious and Learned Dr.* Henry King *Late Lord Bishop of* Chichester, (*whose memory, as obliged, I ever Honour.*) *The other by that worthy Gentleman, Mr.* Miles Smith, *yet Living: Both these Translations of the* Psalms *into Metre, for Elegancy of* Stile, *Smoothness of* Language, *and sutableness to the* Musical Tunes, *far excell the former; and it were to be wished, that one of these Translations, (if Authority thought fit,) might be allowed and used in our Churches: And this may be easily done, It being the custom at this time for the Clerk to read every Line to the*

[1] Not "for," as Hannah prints it.

[2] cxxix, footnote; his conjecture there is not borne out by the facts, for this volume does not contain the "Penitential Hymne" or either version of Psalm CXXX.

[3] p. 271.

[4] Containing strictures upon Sternhold and Hopkins, with some discussion of scriptural translation in general.

[5] "Church Hist.," ed. Brewer, 1845, IV, 72—4.

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People before it is Sung; who may without any disturbance, Inform the Congregation, that according to a more refin'd Translation, they are to sing such a Psalm, *the* Common Tunes *agreeing exactly to these as they did to the old.*

Wherefore some few Psalms *out of these two* Translations *I have made use of in this Book; and some other excellent* Translations *of several* Psalms *which were never printed till now. To those which are Bishop* Kings *there is* H.K. *Those of Mr.* Smiths, M.S. *Those with* G.H. *are supposed to be Mr.* George Herberts:[1] *Most of the Hymns were Collected out of an unknown (but no doubt a Pious and Religious) Author.*" Then, after four (unnumbered) pages devoted to "A Table" of first-lines and tunes, follow 97 pages of Psalms and Hymns, both words and music. The signature "*H. K.*" is appended to the following: "Te Deum," "Magnificate," "The Lords Prayer," "The Ten Commandements," and Psalms 57, 16, 12, 143, 26, 63, 84, 95, 47, 98, 118, 34, 121, 146, 150; these are not collected in one group but appear at intervals throughout the book in the order given. Finally, the book closes with two (unnumbered) pages of Index, and a last page containing a Canon for the first verse of Psalm 115, announcements of four of Playford's publications, an "Advertisement," and a Device or Colophon. If the date and contents of this book did not prove it to be the one referred to in the "Advertisement" at the end of the "Preface" in the Second Edition of King's "Psalms,"[2] this new "Advertisement" would settle the question, for it is a cross-reference to that Edition, reading as follows: "There is now in the Press, and will be finished within a few weeks, That excellent Translation of the whole Book of Psalms into Metre, to be Sung to the Common Tunes in Parish Churches, By the Right Reverend Father in God *Henry* Late Lord Bishop of *Chichester*; And are Sold by *John Playford* at his Shop in the Temple." The British Museum copy (catalogued K. 1. 1. 19) was a presentation copy, for this inscription appears on the fly-leaf: "To the R^{t} Hon^{bl} Francis North his Majesties Solicitor Generall This is humbly presented By John Playford"; and on the reverse of the title-page is the bookplate of "The Right

[1] Professor G. H. Palmer, in his elaborate edition of George Herbert (1905; III, 406—419) prints from Grosart ("Fuller Worthies Library: George Herbert," 1874, II, 30—42), for he himself had not been able to consult the book, the five Psalms and the Gloria marked with the initials "G. H." Grosart is somewhat inaccurate in his transcription of title-page and preface, and Professor Palmer is of course unable to correct him.

[2] pp. 271—272, sup.

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Honble Francis North Baron of Guilford 1703." The volume is a thin folio.

There is a tempting opportinity to claim a "fourth" edition, for Henry King; but the evidence is so slight that bare possibility, and not probability, is all that can be maintained. The facts are these: Playford, in his "The Whole Book of the Psalms: with the usual Hymns and Spiritual Songs. . . . London. . . . 1677"[1] (British Museum copy, catalogued M.C. 6; Library of the Archbishop at Lambeth, 75 B. 12), inserts on the last half-page of the "Table," at the end, notices of five "Books of Divine Musick, lately Printed, and sold by John Playford at his shop near the Temple-Church." The fourth of these five "Books" is thus announced: "A New and Excellent Translation of the Psalms into Metre, by the Right Reverend Dr. Henry King late Lord Bishop of Chichester, according to the Measures of the Common Metre, fit to be sung to all our Common Tunes, designed for the Publick Use of the Church, and the Private Use of Families. In Octavo. Price bound 2s." This announcement does not appear in later editions of "The Whole Book of the Psalms,"[2] but it suffices to raise and leave unanswered the question as to whether it is merely an advertisement of the Second Edition, "lately printed," or the title-page of a new edition printed between 1671 and 1677. The only real bit of evidence in support of the latter hypothesis is the word "Octavo," for while the Second Edition has been described above as an octavo (on the authority of the British Museum Catalogue for 1890), the book is called a duodecimo on page 183 of "Bibliotheca Anglo-Poetica" (1815); unhappily, the present writer made no note on this point in his own examination of specimens of the Second Edition, and there are of course two (often conflicting) bibliographial methods commonly employed in this connection: a book may be called 8vo, 12mo, etc., on the basis of the biblio-

[1] In his preliminary "Advertisement" and "Preface," Playford drew freely on King and Fuller again,—with the usual lack of acknowledgment. The frontispiece is the same, except that the plate has been framed with the music and Latin words of the "Gloria in Excelsis," "Gloria Patri," and two Psalms. King's versions of the Lord's Prayer, Creed, and Ten Commandments are included, but the text of the Psalms is that of Sternhold and Hopkins, with some emendations.

[2] E. g., a 1692 printing, wherein the Preface borrows still more from King's, and a 1700 printing, which simply reproduces the 1692 volume; the work was very popular, for the British Museum Catalogue includes fifteen editions (or, at least, fifteen differently dated title-pages) within 60 years.

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grapher's general impression of its size and appearance, or it may be more technically rated on the basis of the actual folding of the leaves. In the present case, it seems likely that Playford and the British Museum cataloguer used the technical method while the compiler of "Bibl. Ang-Poet." used the impressionistic, and that all three were referring to one and the same volume, viz. the Second Edition of King's "Psalms." So, on the whole, the existence of a "fourth" edition may be considered to be barely possible, but not at all probable.

III. SERMONS.

1. "A Sermon Preached at Pauls Crosse, the 25. of November. 1621. Vpon occasion of that false and scandalous Report (lately Printed) touching the supposed Apostasie of the right Reverend Father in God, John King, late Lord Bishop of London. By Henry King, his eldest Sonne. Whereunto is annexed the Examination, and Answere of Thomas Preston, P. taken before my Lords Grace of Canterbury, touching this Scandall.[1] Published by Authority. At London, Imprinted by Felix Kyngston, for William Barret. 1621." Dedication "To the Most Excellent and Illustrious Prince, Charles, Prince of Wales," two leaves. Text, John xv. 20. Sermon, 77 pp. Address "To the Reader," 3 pp. "The Examination of Thomas Preston, taken . . . Decemb. 20. 1621," 5 pp. Finally, on the last page, a short list of "Faults escaped in some Copies."[2] [Bodleian, 4^0 A. 27. Th. B.S., and a second copy 4^0 K. 1. Th.; Lambeth Palace, 100 G 25.]

2. "Two Sermons. Upon the Act Sunday, being the 10th of Iuly. 1625. Delivered at St. Maries in Oxford. Psal. 133. 1. *Behold how good, and how pleasant it is, for brethren to dwell together in unitie.* [The Arms of the University.] Oxford, Printed by I. L. and W. T. for William Turner. Anno Dom. 1625." Next follows another title-page;—"David's Enlargement. The Morning Sermon on the Act Sunday. Preached by Henry King, Inceptor in Divinity,

[1] "In some copies, this clause is wanting in the title-page."—Hannah, cxxiv. The present writer has seen none such.

[2] In the description of these eleven Sermons (except in the case of the 2d ed. of the fifth, which he mishandles, the sixth, which he could not find, and the 2d ed. of the seventh, of whose existence he was ignorant), Hannah's account has been closely followed, corrected by collation with one at least of the copies consulted by the present writer; the shelf-numbers of these copies have been added in brackets, with the name of the Libraries owning them.

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one of his Maiesties Chaplaines in Ordinary. Psal. 18. 36. *Thou hast enlarged my steps under mee, that my feet did not slip.*" Text, Psal. 32. 5. The Sermon occupies 33 pages.—We have next a third title-page; "Davids Strait. The Afternoones Sermon upon the Act Sunday. Delivered by John King, Inceptor in Divinity, one of the Praebendaries of Christ-church, in Oxford. Psal. 71. 20. *Thou which hast shewed me great, and sore troubles, shalt quicken mee againe &c.*" The text is II Sam. 24. 14. Sermon, pp. 43. [The pagination in this Sermon is faulty. Bodleian, 4° I 12. Th.]

3. "A Sermon of Deliverance. Preached at the Spittle on Easter Monday, 1626. Upon Entreatie of the Lord Maior and Aldermen. Published by Authoritie. And Dedicated to the Citie of London. By Henry King D.D. One of his Maiesties Chaplaines in Ordinarie. London, Printed by Iohn Haviland, for Iohn Marriot. 1626." Text, Psal. 91. 3. Sermon, 80 pages. [Bodleian, Sermons (11), and 9 Pamph. 979 (10).]

4. "Two Sermons Preached at White-Hall in Lent, March. 3. 1625. And Februarie 20. 1626. By Henry King, D.D. One of his Maiesties Chaplaines in Ordinarie. London, Printed by Iohn Haviland, 1627." Dedication to King Charles, one leaf.—Text of first Sermon, Eccles. 12. 1. It fills 45 pages. Then a second title-page for the second Sermon (on Psal. 55. 6) which fills 34 pages. [Bodleian, Mar. 831; Boston Public Library, 7450. 68 (8).]

5. "An Exposition upon The Lords Prayer. Delivered in certaine Sermons, in the Cathedrall church of S. Paul. By *Henry King* Archdeacon of Colchester, and Residentiary of the same Church. Hieron. Epist. ad Laetam. *Orationi Lectio, lectioni succedat oratio: breve videbitur tempus quod tantis operum varietatibus occupatur.* London, Printed by *Iohn Haviland*, and are to be sold by *Iohn Partridge* in *Pauls* Church-yard, at the signe of the *Sunne*. 1628." Dedication to King Charles, and Errata, two leaves. Then 365 pages. [Bodleian, 4° L. 35. Th.; Yale University Library, 28. 39, an imperfect copy.]

The title-page of the Second Edition[1] differs in typography, arrangement of details, and device; but the wording is the same, except for the addition of the information, "The Second Impression," in the centre of the page, and this new printer's notice substituted for the old one: "*LONDON*, Printed by *Anne Griffin*. 1634." The

[1] Hannah is singularly inaccurate and inadequate in his account of this volume.

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Dedication[1] remains the same, but the list of "Errata" disappears even though several of the slips remain uncorrected and some new ones (especially in the page-headings) are introduced. The pages are a little larger, but the number of lines in a page remains the same, viz. twenty-five. The volume is extended to 373 pages by reason of the insertion of new matter (unimportant elaborations, at pp. corresponding to 74, 76, 77, and 80 in the First Edition) and the beginning of each new division on a new page (whereas, in the First Edition, each new division follows immediately after its predecessor, with no waste of space). [Bodleian, 4^0 K. 24. Th.; and a copy is in the possession of the present writer.]

6. "A SERMON *PREACHED* At St *PAULS March* 27. 1640. *BEING THE ANNIVERSARY* of His *MAJESTIES HAPPY INAUGURATION TO HIS CROWNE.* By *HENRY KING*, Deane of *Rochester*, and Residentiary of S^t. *Pauls*: One of His *Majesties* Chaplaines in Ordinary. (Device, same as in the Second Edition of the "Exposition," viz. a flaming heart.) *LONDON*, Printed by *Edward Griffin.* 1640."[2] 59 pp., 4^0. Text, Jer. 1. 10. [Bodleian, Sermons 147 (this was evidently a presentation copy, for this legend in MS. appears on the fly-leaf: "Dr. Bennet. Ex dono Authoris.")]

7. "A Sermon Preached at White-Hall On the 29th of May, Being the Happy Day of His Majesties Inauguration and Birth. By Henry L. Bp. of Chichester. Published by his Majesties Command. C. R. London, Printed for Henry Herringman and are to be sold at his Shop in the Lower Walk in the New Exchange. 1661." Text, Ezek. 21. 27. Sermon, 36 pages. [Bodleian, Pamph. 113; British Museum, 4466. e. 42.; Lambeth Palace, 44 E 4 (15).—Unknown to

[1] The Dedication is interesting enough to be worthy of representation here by a few sentences: "To the Sacred Maiestie of My Soveraigne Lord and Master, King Charles. Most gracious Sir; Though I have had two Masters, I never had but one Patron. When by the direction of your Maiesties Blessed Father, my first Royall Master, somewhat was done to disprove that (since confessed) scandall, touching my Fathers Revolt from his Religion, I then addressed my selfe to Your Princely protection, which You so liberally afforded, . . . I confesse, this weake testimony of my service in Gods Church, tooke life from the Example of Your Glorious Fathers worke (I meane that excellent Meditation of his upon this Prayer) and my purpose was to have dedicated it unto Him, as an humble acknowledgement of the many gracious encouragements which I received from his owne mouth, in the times of my Attendance on Him."

[2] This is the Sermon that Hannah failed to find; for a synopsis of it cf. p. 259, sup.

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Hannah, a Second Edition of this Sermon was published in 1713, octavo; Bodleian, G. Pamph. 1036 (19).]

8. "A Sermon Preached at the Funeral of the R' Reverend Father in God Bryan, Lord Bp. of Winchester. At the Abby Church in Westminster. April 24. 1662. By Henry L. Bp. of Chichester. London, Printed for Henry Herringman, and are to be sold at his Shop in the Lower Walk in the New Exchange. 1662." Text, Psal. 116. 15. Sermon, 44 pp. [Bodleian, Pamph. 110, 118; Lambeth Palace, 44 D 12 (9).]

9. "Articles of Visitation and Enquiry Concerning Matters Ecclesiastical: Exhibited To the Ministers. Church-Wardens, and Side-men of every Parish within the Diocess of Chichester. In the first Episcopal Visitation of the Right Reverend Father in God Henry by Divine Providence Lord Bishop of Chichester. London, Printed for Henry Herringman. M. DC. LXII." 14 pages, in black letter. [Bodleian, B. 7. 9. Linc.]

10. "A Sermon Preached at Lewis in the Diocess of Chichester, by the Lord B^{p} of Chichester, At His Visitation Held there, Octob. 8. 1662. London, Printed for Henry Herringman, and are to be sold at his Shop in the Lower Walk of the New-Exchange. 1663." Text, Tit. 2. 1. Sermon, 44 pages. [Bodleian, Sermons, 11; Lambeth Palace, 77 H 6 (17).]

11. "A Sermon Preached the 30th of *January* at White-Hall, 1664. Being the Anniversary Commemoration of K. CHARLS THE I, Martyr'd on that Day. By *Henry King* Lord Bishop of Chichester. Printed by His MAJESTIES Command. *LONDON*, Printed for *Henry Herringman*, and are to be Sold at his Shop in the Lower Walk of the *New-Exchange*. 1665." Text, II Chron. 35. 24, 25. Sermon, 43 pages. [Bodleian, Mar. 827; Lambeth Palace 44 D 12 (1); New York Public Library, CI p. v. 103, No. 13.]

All these items, with the exception of no. 9 and the second editions of 5 and 7, were first briefly listed by King's earliest bibliographer, Anthony à Wood.[1] Aside from these, various other Sermons by

[1] "Athen. Oxon.," III. 839—841. Wood gives a brief title but no description of these pamphlet Sermons (all 4to, except the 2d ed. of 7), and consequently fails to notice the interruption which gives two dates to 5. So this paragraph should be quoted from the section dealing with the clause, "Thy Kingdom come" (1st ed., 101—2, 2d ed., 104—5): "Methinkes I should not goe on in this subject, and not allow Him, a roome in it; nor can we effectually pray for the comming of Christs Kingdome, and not first, give Him thanks for the comming home of our owne. Indeed our Kingdome shifted

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King are referred to,[1] but no record of the publication of any other has been found by the present investigator.

IV. LATIN AND GREEK VERSE.

Wood mentions no examples of this class, while Hannah[2] lists the following: Latin verses in the [Oxford] collections on Prince Henry's death [1612] (Sig. G2); on Bodley's death [1613] (pp. 65–70); on the Marriage of the Princess Elizabeth [1613] (Sig. K3); in *Iacobi Ara* [1617] (Sig. E); in *Annae Funebria Sacra* [1619] (6 pages, ending on Sig. R); and in *Parentalia Iacob*[*i*],[3] 1625 (Sig. I4); together with Greek verses in the Collection on the Marriage of the Princess Elizabeth (Sig. P3). To these items a few others can now be added: "*In*

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place, our Iland swam from us and made an Inroad upon the Continent, where awhile it stucke. Yea, our Hearts travelled from us, bound on a voyage in which all our Hopes were adventured." In the margin beside the text is this note in the First Edition, "The Prince his returne from *Spaine*," and this in the Second, "Prince Charles his returne from *Spaine*. *Oct.* 6. 1623." The reference is, of course, to the curious expedition of Charles and Buckingham to Madrid, in furtherance of the projected Spanish marriage (cf. Gardiner, ch. xliii–xlv), and consequently this date fixes the period of King's delivery of the first part of his "Exposition." The evidence of the interruption occurs on pp. 242–3, 1st ed., and 247, 2d ed., in this statement—which also shows that this series was delivered at intervals and not on consecutive Sundays—: "I must confesse my selfe indebted for the handling of this Text, betwixt the first part whereof & this hath passed so large a time, that it is now become a stale Arrerage. And though the Contagion which lately dispersed us, hath diminished many of those hearers unto whom I was a Debtor, I am ready to discharge it to you, being desirous to pursue my first intent (though some times by other service interrupted) of going thorow the severall Petitions of this Prayer." The reference here is obviously to the London plague of 1625; that King avoided the pestilence is shown by his proceeding B. D. and D. D. at Oxford on the 19th of May, 1625 ("Fasti Oxon.," II, 423), and by the dates and places of delivery of Sermons 2 and 3.

[1] Cf. p. 250 sup.; also Letter 4, p. 289, Appendix B; and Pepys' "Diary," ed. Wheatley, under July 8, 1660: "The Bishop of Chichester preached before the King, and made a great flattering sermon, which I did not like that Clergy should meddle with matters of state"; and under Mar. 8, 1662; "I walked thither (i. e., to Whitehall) and heard Dr. King, Bishop of Chichester, make a good and eloquent sermon upon these words, 'They that sow in tears shall reap in joy.'"

[2] cxxiii; his list has been slightly emended in the present work.

[3] Hannah prints *Iacobo;* and omits the bracketed dates, throughout.

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obitum sanctissimi viri Di. Dris. Spenseri," etc., 1614;[1] 6 Latin Epigrams, and 1 Greek Epigram, written to his Father, "Reverendo admodum Christo patri, Johanni Episcopo Londinensi, Patri meo benignissimo," undated, in Rawl. MS. D. 398, ff. 243–244v, in the Bodleian;[2] and a Latin "Epitaphium" for Bishop John King, apparently in Henry King's autograph, in Rawl. MS. D 398, fol. 195.[3]

V. LETTERS.

Wood mentions only two items in this class, the letter to Usher[4] and the letter to Walton;[5] Hannah adds only one more, the brief note to Mr. Powell included in Appendix B, below. Of the items which can now be added, three are given, in full or in part, in Appendix B, and the others may be listed as follows: (4) a letter to Gilbert Sheldon, Archbishop of Canterbury, dated Feb. 21, 1666, at Chichester, refusing to institute Francis Chaloner to the rectory of St. John's, Lewes (in Tan. MS., xlv, fol. 64, in the Bodleian); (5) and (6) two

[1] Fourteen elegiac distichs (accompanied by a verse translation of all but the last) found in the Bodleian, Rawl. MS. D. 912, fol. 305.

[2] These items, with some of those in the next Class, properly belong among the MSS. in Part One of this Bibliography; but it seemed more convenient and sensible to group them here with the rest of their Class.

[3] In the MS. this "Epitaphium" bears, on the reverse of the single torn sheet, the fragmentary address, "To the Righ/Mr Henrie K/these," and so was apparently submitted to someone else for approval, or was later found and returned by someone else, for the address is in a different hand. Now this "Epitaphium" is a duplicate, or probably the original, of the third part of the inscription on the memorial "Table" or tablet by John King's grave; it differs from the carved version in only one particular—the reading "Lapida" for "lapidum", in the second line. "Lapida" makes better sense but worse metre. In the MS. the second chronogram is complete, while the first chronogram, the Anagram, and the text (Philip. I, 1, 2) are represented only by fragments. The fact that Henry King wrote the "Epitaphium" (and a careful study of the several letters undoubtedly written by Henry King has perhaps qualified the present writer to recognize his chirography elsewhere) makes it possible that he also at least had a share in the composition of the two longer inscriptions (Cf. p. 283, inf.)—It should be stated that the whole "Table," with all the various inscriptions, is reproduced in full on p. 73 of Dugdale's "History of St. Paul's Cathedral," London, 1716.

[4] Originally printed as Letter cclxv in Richard Parr's "Life of .... Usher, Late Lord Arch-Bishop of Armagh," etc., p. 567.

[5] Too readily accessible in various editions and biographies of Hooker and Walton to need reprinting here.

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letters to the same, dated July 23 and Aug. 16, 1668, in behalf of Thomas Wilkinson, vicar of Waltham St. Lawrence, urgently seconding his petition for a dispensation to hold the vicarage of Icklesham (in Tan. MS. xliv, ff. 20 and 24).

VI. SPURIOUS OR DOUBTFUL WORKS.

Here may be briefly listed eight poems which will be printed in full and their authenticity discussed in the ed. of King's poems to be published by the Yale Press; the first four are probably King's work, the last four probably not: "A Contemplation upon Flowers," "The Complaint," "On his Shadow," "Wishes to my sonne John, for this new and all succeeding yeares: Jan. 1. 1630," "An Elegy upon ye Kg of Swedens Death (1632)," "On Sir Walter Raleigh. by w. R." "Doctor King his Farewell to the world," and "Sleepe, Pretious Ashes, in thy sacred Urne."[1]

W. C. Hazlitt has this entry at page 488 of his "Handbook to the Popular, Poetical, and Dramatic Literature of Great Britain," London, 1867: "Psalmi Aliquot Davidici in metrum Latinum traducti. Cum Adiectione Decem Psalmorum ad notas suas Musicas (ut in Anglicana Versione) compositorum. In usum Academiae, Oxoniae, Excudebat Joannes Lichfield, Almae Academiae Typographus. Anno Dom. 1630. Sm. 8vo 16 leaves." He adds a list of the authors, among whom "King" appears; and according to the General Index, this King was Henry King. Now, inasmuch as the British Museum copy (the title-page of which bears the MS. endorsement, "Hic est liber Jo: Euelyni 1639"; shelf-number, 3434. b. 38) shows no dedication or preface and no Table of Authors, while the Psalms (all in Latin) in the text are unsigned, Hazlitt's unsupported assertion is not enough to prove Henry King's authorship, for Hazlitt is very inaccurate in some other references to the King family.

Thomas Warton, in his "History of English Poetry," ed. Price, 1840, III, 232, ascribes to "Dr. Henry King, son of King bishop of London," a little volume called "The Surfeit. To A B C. London, Printed for Edw. Dod, at the Gun in Ivy-Lane. 1656." pp. 82.

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[1] Other poems (which must be classified as Doubtful here, because the writer has been unable to verify the reference) are alluded to in this citation: "In a book of William Slatyer's elegies, dated 1619, are a 'sonnet' and several other poems by Henry King, with the initials H. K. as signature." The only work with this date by Slatyer inthe British Museum (shelf number, 1070. l. 1.) is called "Pandionium Melos," and consists of elegies and epitaphs on the death of Queen Anne of Denmark, all apparently written by Slatyer himself.

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Warton's assertion is unsupported and has not been generally accepted. Hannah (xcvii) follows Malone in assigning the book to Henry King's youngest brother, Philip. The Bodleian copies, 8° C. 139 Linc., and Malone 497, are catalogued under the name of Philip Kinder or Kynder, whose authorship one H. A. Evans is said to have demonstrated in the "Academy" for June, 1902.[1] At any rate, there seems to be no reasonable ground for believing that Henry King wrote the piece.

A more serious attempt to augment Henry King's bibliography unjustifiably is the following entry in the catalogue of the British Museum, under Henry King's name: "A Sermon Preached Before the Kings Most Excellent Majesty at Oxford, by *H. K. D. D.* Oxford, Printed for W. Web. 1643." One copy of this sermon (shelf-number, 4474. d.) has the date "Mar. 16, 1642" substituted in early MS. for "1643." A second edition (shelf-number, 4474. d. 85; same title-page, except for addition of text, Psalm ci, 1, and this new publisher's announcement: "First Printed at Oxford for W. Web, and now reprinted at London for G. T. and are to be sold in the old Baily, 1643.") is also credited to Henry King, in the catalogue of the British Museum.[2] Unfortunately for the validity of this ascription, a second copy of the First Edition (shelf-number, E. 93. (13).) is twice attributed to Henry Killigrew elsewhere in the catalogue,—under "K., H." and "Killigrew, Henry." Hazlitt ("Bibl. Coll. and Notes," 4th Series, 1903, 213), without question or explanation, places it among Henry King's works, and to that extent supports the British Museum's first ascription. The Bodleian copy, however, is not catalogued under Henry King's name, and Wood did not assign it to him. Moreover, Henry King, created Bishop of Chichester on Feb. 6, 1642, would hardly have omitted his Episcopal rank from the title-page and would hardly have been in Oxford during the first weeks or months of his tenure of office (if "March 16, 1642" be correct, or approximately so). Internal evidence is conclusively against the assumption of King's authorship: the homiletic method, the format,[3] and the style are totally different from King's; the writer uses "Isai" as an abbreviation of "Isaiah," where King always uses "Esai."

[1] The present writer has been unable to verify this reference, and includes it merely for the sake of what it may be worth to other investigators. Cf, "Shakspere Allusion-Book," ed. by J. Munro, 1909, II, 65.

[2] This may be true no longer, for the present writer convinced the authorities of the error, and a correction was promised in both cases.

[3] Due, doubtless, to the new printer; but why should King have changed his printers?

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or "Esay."; and there is a total absence of parallels to King's poems, whereas King's genuine sermons are replete with obvious echoes or sources of his poetry.[1]

A MS. Sermon preached at the funeral of the Countess of Leinster, who was buried July 3, 1657, is included in the larger MS. volume of King's poems, but in a different hand; and Hannah somewhat reluctantly shows[2] that it cannot have been produced by Henry King.

The two long Latin inscriptions on the "Table" or marble slab set up beside Bishop John King's grave[3] might perhaps be claimed for Henry King, inasmuch as his authorship of the accompanying "Epitaphium" has been fairly well established above (p. 280, Note 3); at any rate, it is reasonable to suppose that the eldest son had a hand in composing these tributes, even if he did not produce every line himself. Unfortunately they seem to be marked by bad Latin and worse taste.

Finally, a professional copyist in London has transcribed this note: "Catalogue of Western MSS. in Trin. Coll. Camb. By M. R. James. 4 vols. (last, 1904). Letters by King, Bp. H., 699, 45." These Letters are classified as "Doubtful" merely because the present writer has been unable to verify the reference and so cannot absolutely guarantee their genuineness.

APPENDIX A.

An Epitaph:

Reade, twas a Berkley: birth, and bloud are knowne
from Ancestours, the rest were all her owne
Rich, faire, and young; rare lines of grace to fall
upon one center: that unites them all:
all goods of body, fortune, and behinde
the chiefe endowments of a heavenly minde;
These glorious stiles she made should be his glory
from whom they came; and all her life a story
her Trewant sexe might reade, and imitate,
whom she outstript in goodnes, as in fate;

[1] This last is, of course, the further argument for Henry King's having been the author of "Poems, Elegies, Paradoxes, and Sonets," referred to in Note 6, p. 265, sup.

[2] lxiii, lix; 203. [3] Cf. p. 231, sup.

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each course she rann through, was a patterne sett
some coppyed vertue from her to begett;
Childe, mother, friend, and wife, these states she past
proved her obedient, tender, sweet, and Chaste;
Her Consort was, as was her soule Divine;
what greater Titles wooed her might repine,
she would devote herselfe to bee his bride.
whose calling wean'd her from all pomps and pride;
But shee first wean'd herselfe, then chose that state,
a married Moniall orderd by her mate:
shee thought that thus much neerer heaven shee gott
by singling out a Guide from Levies Lott;
There she a better Trinity enioyes
Leaves him for's paines a Triade of her boyes,
goe now fond dames, and say here lyes interrd.
one that her soule 'fore all the world preferrd.

An Elegie upon ye death of M^ris^ Anne Berkley, wife to Mr Henry King.

. . . . . .

Hir Genial bed, enrich't wth chastitie,
Was crown'd wth triumphes of fertilitie.
Children were sure, & frequent: eury year
By a new darling was seal'd currant here.
Hir Births were Almanakes; & shee ye Root,
Prognosticated seasons by hir Fruit.
Thrice happy mother! who, w^thout^ ye sunn,
Numbring hir blessings, knew ye year was done.
But now, these Mathematikes being lost,
Our seasons fail, our reckonings still are crost:
Now, since additions of new yeares wee lack,
Wee must bid our Astronomie looke back:
Where yet, three stars appear, three lovely Boyes;
(Heav'n might have stil'd them still, their Mothers ioyes;)
Two ran before to God, but pure & young;
Heav'ns mercy striving to p^r^vent their tongue:
They, they are gone; & now triumphant sing
Seraphike Carols to their glorious King.
But these poore litle ones, must mourne in blackes,
And wear vnknowne, bought sorrowes, on their backes;
Till they grow vp to greifes; & hand in hand
Att once learne, how to weepe, & vnderstand:

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Till they may say, 'Tis time: wee are of yeares,
To challenge our Inheritance of Teares.
Lend to those Orphanes, or lay out an Ey,
Some tender soul, till they can pay, & cry.

Yet stay. This shrine doth all those eys disdaine,
That cheat all funeralls, wth a forced raine
Eyes ready, that (like watermills for graines)
Can ebb, & flow, according to their gaines,
That rent out moysture, to each wealthy grave,
Where heires their pounds, freinds may their scruples have.
Vanish such easy shewres; wch some full feast
Engendring, are lay'd vp, till they are prest
To serve att Funeralls: such greifes weep rheumes,
And for true sighs, vent onely stomach fumes.
. . . . . .

Wishes to my sonne John, for this new, and all succeeding yeares: Jan. 1. 1630:

If wishes may enrich my Boy,
my Jack, that art thy fathers Joy,
they shall be showr'd upon thy head
as thick as manna, Angells bread;
And bread I wish thee, this short word
will furnish both thy backe and boord;
not fortunatus purse, or Capp,
nor danaes gold-replenisht Lapp
can more supply thee; but content
is a large patrimony, sent
from him who did thy soule infuse,
maist thou this best endowment use
in any state; thy structure is
I see compleate; A frontispice
promising faire; may it nere bee
Like Jesuites volumes, where we see
Vertues, and Saints adorne the front,
doctrines of deuills follow on't:
may a pure soule inhabite still
this, well mixt clay; and a streight will
By act by Reason, that by grace;
May Gemms of price maintaine their place

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in such a Caskett: For that list
Chast Turkois, sober Amethist,
that sacred breast plate still surround,
Urim, and Thummim be there found,
which for thy wearing I designe
that in thee Kinge and priest may Joyne:
As 'twas thy Grandsires choice, and mine
maist thou attaine John the diuine
chiefe of thy Titles; though Contempt
now brand the Clergie; bee exempt
I euer wish thee, from each vice
that may that Calling scandalize:
Let not thy tongue with court oyle flow,
nor supple language lay thee low
for thy preferment: make Gods cause
thy pulpits taske, not thine applause;
maist thou both preach by line, and life;
That thou liue well and Chaste, a wife
I wish thee, such as is thy sires,
a lawfull helpe 'gainst lustfull fires;
And though promotions often frowne
on mareyed browes, yet lye not downe
in single bawdry; impure monkes
that banish wedlock, license punkes;
Peace I doe wish thee from those warres
which Gowne-men talke out at the Barres
some times a yeare; I wish thee peace
of Conscience, Country, and encrease
in all that best of men commends,
favour with God, good men thy friends;
Last, for a lasting legacy
I this bequeath, when thou shalt dye
Heauens monarch blesse mine eyes, to see
my wishes crowned, in crowning thee.[1]

[1] This poem appears (unsigned) on ff. 101v, 102, Harl. MS. 6917 (cf. Biog., 245, N. 3). If one of two details be emended, this piece may be unhesitatingly assigned to King: we should read either "Jan. 1, 1622 (or 3, or 4)," in the title, or else "such as *was* thy Sires," at line 41, p. 286. With either of these alterations, the internal evidence would establish King's authorship beyond question. The other alternative is the hypothesis broached in the Biog., pp. 238—239, that this poem is correct and authentic as it stands, and

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APPENDIX B.

Letter 1.[1]

D^r^. Henry King, Bishop of Chichester, to Edwd. Bysshe, Esq.

Hitcham neere Maydenhead,
Jany 22, 1656.

Worthy S^r^,

According to y^r^ desire (wch to me is a command) on Mr. Dugdale's motion, I searched all the Papers I had left, to find some Notes long since taken, concerning the Church of St Paul. But through the barbarous usuage of a wretched Committee at Chichester, I was not only depriv'd of those, amongst severall collections of higher moment, but denyed my owne Private Papers, wch had bene the moniments of my course in study through all my life.

These few scribled notions,[2] recalled to my memory, I have enclosed, wch perhaps may prove as unusefull, as uneasy to be read. From wch meane test you may please to conclude how forwardly and wth what alacrity I wold serve you, did any faire occasion point out the way. At my last being in London, for a day or two, I was to wait on you, who (as y^r^ servant told mee) were abroad. I wth him left my service, to y^r^self and worthy Lady, wch I now againe tender to yee both; wth an acknowledgment of y^r^ many undeserved favours, especially that excellent Book, bestowed upon

S^r^

Your most faithfull and affectionate servant,

Hen. CHICHESTER.

---

the reference in 286, 41, concerns his second wife, *not* Anne Berkeley. The whole passage, 286, 40—46, certainly suggests the unromantic, utilitarian kind of marriage which has already been inferred from other indications. In this case, "The Anniverse" must have been written only a very short time before the second wedding; but, of course, "1630" in the title of the present poem really means "1631".

[1] Reprinted from pp. 317—8 of "The Life, Diary, and Correspondence of Sir William Dugdale, Knight .... Edited by William Hamper, Esq. .... London .... 1827".

[2] "An account of the repairs of the Cathedral in the times of James I. and Charles I. amplified and used by Dugdale in his History of St. Paul's, p. 134" (footnote to p. 318, in Hamper's "Life," etc. of Dugdale). In the 1716 ed. of Dugdale's work this account fills pp. 137—145, Henry King's name appearing on pp. 138 and 141.

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I beseech you remember my respects to Mr. Dugdale, whose ingenuity and industry is to be much valued. If, wth the mention of my Father buryed in the South Ile of the Church, you judge it fit to insert that of my Father's Great Uncle, Robert King, being consonant to that of my Father, in the Survay of London, and without imputation of vanity; I have a sequestred Person's mite to offer Mr. Dugdale, when he decyphers my Father's Grave-stone.

To my much honour'd Friend Edward Bish Esquire, at the Office of Armes, a little below the Doctors Commons. Present this.

Letter 2.[1]

S^r^.

Out of the apprehension of many kind favours, all wch were crowned in y^r^ last most friendly proposition, give mee leave to make this acknowledgment and render y^u^ my thankes. I know verbal restitutions hold no proportion wth reall courtesyes, yet untill I may be capable to serve y^u^ in the last, y^u^ must accept this pledge of my affection. I was not unmindfull of y^r^ message to my Cosen Duncumbe. Had Sr Robt Heathe kept his resolution, wch failed, you showld have understood more of a willingness to embrace y^r^ motion. S^r^ my deceased brother possessed a faire roome in y^r^ opinion. If y^u^ please to allow mee his successour, I shall study wayes to declare myself y^r^ affectionate frend and Servant, Hen: King.

London, Dec. 13, 1639.

My service to Mrs. Powell and all y^rs^.

To my noble and much esteemed [Seal]
Friend
Mr. Powell at Fostell
Present this.

[1] Hannah makes the following statements about this letter (xxxviii): "The conclusion of the following letter, which is now first published from the original (in the possession of Mr. Pickering), undoubtedly bears reference to his (i. e., Henry King's brother, John) death; but I regret to say that it is the only allusion contained in it which I am able to explain. If, as seems very probable, 'Fostell' is an abbreviation for 'Forest-Hill,' the person to whom it is addressed will be Richard Powell, (the father-in-law of Milton)." On "Cosen Duncumbe," cf. Footnote 1, p. 242, sup. Sir Robert Heath's devout little autobiography (pub. by the Philobiblon Society, "Bibliographical and Historical Miscellanies," Vol. I, 1854) casts no light on Henry King's allusion. It is at least a peculiar coincidence, however, that the letter (dated Aug. 30, 1649) affixed to this memoir in the original MS., written apparently by a body-servant, private secretary, or humble friend of Heath's, should be signed "David Powell."

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Letter 3.[1]

[Henry King, Bishop of Chichester, to Gilbert Sheldon, Archbishop of Canterbury; April 23, 1666.]

. . . . When Y^r^ Grace propownded my subscription to the Former Aid [an appeal from Charles II, as appears from an earlier statement in the letter], I willingly gave a Thousand Pounds wch is the Full Revenew of my Bishoprick. Besides I gave 200l. towards the Redemption of Captives from Algiers. I shall now wth all alacrity subscribe 500l. wch is the half of my yearly in-come. And rather than so Gratious a Maisters occasions shall suffer, I will put Myself & Family to Boardwages and contribute what I thence save . . . .

Letter 4.[2]

To the Most Reverend Father, Gilbert Lord Archbishopp of Canterbury His Grace— humbly present—

May it please your Grace!

Your letter of Jan: 25 intimates, that I am commanded to Preach before His Majesty, the 28th of February next. Y^r^ Grace likewise requires that I should signify my obedience in undertaking it. I shall (by the help of God) prepare Myself for that service, And Then also render to Yourself that observance wch is due from

My Lord!

Y^r^ Graces most humble seruant

Hen: Chichester.

From Chichester.
Febr: 3: 1668.

[1] This excerpt is taken from Tanner MS. xlv, fol. 73.

[2] Taken from Tanner MS. xliv, fol. 80. This letter was written less than eight months before Henry King's death. No record of the Sermon mentioned survives.

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PETRUNKEVITCH, ALEXANDER, Arachnida of North America. $1.40
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Hepaticae: Yale Peruvian Expedition of 1911

BY

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V.—HEPATICAE: YALE PERUVIAN EXPEDITION OF 1911

By Alexander W. Evans, Ph.D.

INTRODUCTION

The Yale Peruvian Expedition of 1911, under the direction of Professor Hiram Bingham, carried on extensive explorations in the southeastern part of Peru. Although the main purpose of the Expedition was the accumulation of data on the Geology and Archeology of the region, collections of invertebrate animals and of plants were made by Professor Harry Ward Foote, one of the members of the party. Instead of attempting to collect indiscriminately he wisely restricted his attention to a few definite groups, and the group of the Hepaticae was among those selected. The material of this group comprises thirty-five packets, several of which contain an admixture of two or more species. Thirty-one species in all, representing fourteen genera, are in a condition to be identified. The specimens came from seven different localities, namely: Cuzco (one species), Huadquiña (three), Lucma (five), Ollantaytambo (two), San Miguel (sixteen), Santa Ana (nine), and Urubamba (one). The following information about these localities has been furnished by Professor Foote. Cuzco, Ollantaytambo, Santa Ana, and Urubamba are all well-known towns, the last three being situated on the Urubamba River, which flows in a general northwesterly direction. Cuzco is a few miles distant from the river and nearer its source. San Miguel is a small district twenty or twenty-five miles below Ollantaytambo and is not to be confused with the town of San Miguel in the northwestern part of Peru; Huadquiña is a large estate lying a few miles below San Miguel; while Lucma is a town on the Vilcabamba River, a small branch of the Urubamba entering from the west a few miles south of Santa Ana. Cuzco, at an elevation of 11,500 feet, is well above the forest line, although a single species of tree was observed there. Urubamba, Ollantaytambo, and Lucma, at elevations varying from 7,000 to 9,500 feet, are also above the true forest line, in spite of the fact that several species of trees are of occasional occurrence. San Miguel, Huadquiña, and Santa Ana, at elevations varying from 3,000 to 6,000 feet are all in a region which is either forested now or has been in former times. The primary growth

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contains a large proportion of trees, but the secondary growth contains few trees and many bushes. There seems to be little tendency for the original species to reappear after deforestation, even if the land is left completely uncultivated. The entire region explored has a long dry season and suffers from lack of water.

The hepatic flora of the Andes, except at very high altitudes, is rich and varied. It includes some of the largest and most conspicuous of the leafy forms, a great many smaller and less striking species, and a fair proportion of thallose representatives. The number of endemic genera is exceedingly small, *Myriocolea* Spruce (with one species), *Mytilopsis* Spruce (also with one species), and *Stephaniella* Jack (with two species) being the only ones known at the present time. Most of the Andean species belong to large and widely distributed genera, such as *Plagiochila*, *Radula*, *Porella*, and *Frullania*. The Lejeuneae, also, as in most tropical regions, are numerous and diverse. Certain genera, such as *Gymnomitrium*, *Marsupella*, *Lophozia*, and *Scapania*, which are so richly developed in the arctic and alpine districts north of the tropics, are either absent altogether or very sparingly represented. In the present collection there are three thallose species (one *Plagiochasma*, one *Marchantia*, and one *Metzgeria*), nine *Plagiochilae*, five *Frullaniae*, and nine members of the Lejeuneae. The remaining five species belong to the genera *Lophocolea*, *Radula*, and *Porella*. Six of the species are apparently undescribed; the others include a number of widely distributed species and a somewhat smaller number confined to the Andes. The geographical distribution will be more fully considered in connection with the individual species. The type-specimens of the new species will be deposited in the herbarium of the writer at New Haven, Connecticut.

Several important works dealing wholly or in part with the Hepaticae of the mountainous portions of Mexico, Central America, and South America, have been published, although nothing has yet appeared which deals exclusively with the Hepaticae of Peru. The following works have been of especial service in the study of Professor Foote's material, although numerous shorter papers have of course been consulted:

Montagne, C. Florula Boliviensis. In d'Orbigny, A., Voyage dans l'Amérique Méridionale. **7**[2]: 1–119, *pl. 1–3*. 1839. The Hepaticae treated in this work were, for the most part, collected by Alcide d'Orbigny during the years 1826–1833, in various parts of South America. Among the species discussed forty-five came from Bolivia, ten of which at that time were supposed to be endemic. Seven

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of the Bolivian species are figured. The Florula is the first important contribution to our knowledge of Andean Hepaticae and is even now indispensable to the student.

GOTTSCHE, C. M., LINDENBERG, J. B. G., AND NEES VON ESENBECK, C. G. Synopsis Hepaticarum. Hamburg, 1844–1847. This is the first general account of the Hepaticae of the world and includes numerous species from various parts of the Andes.

GOTTSCHE, C. M. De Mexikanske Levermosser. Kongl. Danske Vidensk. Selsk. Skrift. V. Naturv. og Math. Afdel. **6**: 97–380, *pl. 1–20*. 1863. This important work is based on the collections of F. Liebmann, made in various parts of Mexico but mostly in mountainous regions. About two hundred species are described, quite a number of which range beyond Mexico into Central and South America. Most of the plates, which are of a high degree of excellence, are devoted to the large and difficult genus *Plagiochila*.

GOTTSCHE, C. M. Hepaticae. In Triana, J., & Planchon, J. E., Prodromus Florae Novo-Granatensis. Ann. des Sci. Nat. Bot. V. **1**: 95–198, *pl. 17–29*. 1864. Most of the species enumerated in this work were collected by Alexander Lindig, during the years 1859–1861, in the province of Bogota and in other parts of Colombia. With two exceptions the species figured belong to the genus *Plagiochila*.

SPRUCE, R. Hepaticae of the Amazon and of the Andes of Peru and Ecuador. Trans. Bot. Soc. Edinburgh **15**: xi + 588, *pl. 1–22*. 1884–1885. This remarkable volume must always remain a model for the student of taxonomic hepaticology. It is particularly valuable for its account of the Lejeuneae. The work is based on collections made by its author during the years 1849–1862. The species figured are selected from the various subdivisions of the Hepaticae.

SPRUCE, R. Hepaticae Bolivianae. Mem. Torrey Club **1**: 113–140. 1890. The collections forming the basis for this article were made by H. H. Rusby in eastern Bolivia.

JACK, J. B., AND STEPHANI, F. Hepaticae Wallisianae. Hedwigia **31**: 11–27, *pl. 1–4*. 1892. The Hepaticae enumerated in this paper were collected by Gustav Wallis, between the years 1860 and 1878, some of them in the Philippines but the majority in Colombia and Peru.

STEPHANI, F. Species Hepaticarum. 1898–1914. The latest work dealing with the Hepaticae of the world. Four large volumes have already appeared and the fifth, which will probably be the last, is in course of publication. The work is issued under the auspices of the Herbier Boissier at Geneva, the earlier parts having been printed in their Bulletin and Mémoires and the later parts as a Complément to the Bulletin.

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SPECIAL PART

MARCHANTIACEAE

I. **Plagiochasma** Lehm. & Lindenb.

1. **Plagiochasma chlorocarpum** (Nees & Mont.) Mont.

Reboulia chlorocarpa Nees & Mont. Ann. des Sc. Nat. Bot. II. **5**: 70. 1836.

Plagiochasma chlorocarpum Mont. Fl. Boliv.; d'Orbigny, Voy. dans l'Amér. Mérid. **7**[2]: 59. 1839.

Rupinia chlorocarpa Trevis. Mem. R. Ist. Lomb. III. **4**: 437. 1877.

On earth, Ollantaytambo, 9,000 feet, July 31, 1911.

The species of *Plagiochasma* are in need of considerable study before they can be considered well understood. The determination of the present specimens, therefore, must be regarded as provisional, more especially as the few capsules present are not in good condition. *P. chlorocarpum* is one of the species characterized by minute epidermal pores. The type material was collected by Bertero, in Chile, in 1828, and the species has been reported also in Gay's collections from the same country. Apparently no other stations have been recorded. Soon after the publication of *P. chlorocarpum* a second species of the genus, likewise based on specimens collected by Bertero in Chile, was proposed by Bischoff under the name *P. validum*.[1] This species, which is recognized as valid by the authors of the Synopsis Hepaticarum and also, much more recently, by Stephani, has been reported from Bolivia as well as from Chile. Two Bolivian stations have been recorded: Sorata, *Mandon*, by Stephani,[2] and the vicinity of Mapiri, *Bang*, by Rusby.[3] If the descriptions given by Stephani of these two species are carefully compared no essential differences between them are apparent, and it is possible that *P. validum* represents a synonym of *P. chlorocarpum*. Unfortunately the question can not be settled at the present time, although the writer has examined a specimen of Bischoff's plant in the herbarium of the British Museum and has also seen Bang's specimens in the herbarium of the New York Botanical Garden. The latter are apparently the same as those listed above from Peru, but the Bischoff specimen is sterile and so fragmentary that no definite conclusion can be drawn from it.

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[1] Handb. Bot. Term. und Systemk. **2**: 56. *pl. 56, f. 2753.* 1842.

[2] Bull. de l'Herb. Boissier **6**: 785. 1898.

[3] Mem. Torrey Club **6**: 129. 1896.

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The close relationship between *P. chlorocarpum* and *P. peruvianum* Nees & Mont. has already been commented upon by Montagne.[1] *P. chlorocarpum* may be distinguished, however, by its dioicous inflorescence and by its lack of apical innovations, the branching being either by forking or by means of lateral adventive shoots. In *P. peruvianum* the inflorescence is monoicous and apical innovations are frequently seen. The original material of *P. peruvianum* was collected by d'Orbigny in Bolivia and not in Peru, and no additional collections have been reported.

II. **Marchantia** L.

2. **Marchantia lamellosa** Hampe & Gottsche

Marchantia lamellosa Hampe & Gottsche; G. L. & N. Syn. Hep. 527. 1846.

On a dry earth bank, Cuzco, 11,500 feet, July 6, 1911.

The present specimens include two gemmiparous plants only and are referred to *M. lamellosa* on account of the conspicuous scales, which are deep purplish black in color and almost cover the ventral surface. Unfortunately the absence of sexual branches and of sporophytes makes a positive determination impossible. *M. lamellosa* was based on material collected by Moritz in Colombia. It has recently been recorded from Ecuador by Stephani, but apparently no other stations are at present known.

METZGERIACEAE

III. **Metzgeria** Raddi

3. **Metzgeria scyphigera** sp. nov.

On apple wood, Urubamba, 9,500 feet, July 17, 1911. The same species was collected by Barnes & Land at La Cima, Mexico, in lava fields (but on wood), at an altitude of 9,800 feet, on October 14, 1908, specimens received from W. G. Farlow. The Peruvian material may be designated the type.

Yellowish green, sometimes tinged with blue, growing in depressed mats: thallus when normally developed prostrate, repeatedly dichotomous, well-developed branches about 1 mm. wide, mostly 0.9—1.5 mm. long between

[1] Fl. Boliv.; d'Orbigny, Voy. dans l'Amér. Mérid. 7²: 60. 1839.

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the forks, plane or slightly convex along the margins; costa bounded both above and below by two rows of cells; wings mostly fifteen to twenty cells wide, the cells thin-walled but with very minute trigones and occasional intermediate thickenings, averaging about 40 × 30 μ and about 30 μ along the margins; hairs restricted to the margin and to the ventral surface of both wings and costa; marginal hairs sometimes abundant, sometimes very scanty, straight or nearly so, mostly 100—120 μ in length; alar surface hairs and costal hairs similar but a little longer, the surface hairs never abundant and often absent altogether: inflorescence dioicous: ♀ branch (known only from the type specimen) obcordate, orbicular-obovate, about 0.15 mm. long, bearing a few straight marginal and surface hairs: ♂ branches (known only from the Mexican specimens) sparingly produced, globose, about 0.3 mm. long, usually smooth throughout: gemmae numerous, marginal, usually borne on more or less ascending and tapering branches, limited in growth and destitute of hairs (except slime-papillae), orbicular or oblong-orbicular, about 0.15 mm. wide, concave, about six cells across, bearing a few rudimentary marginal cilia slightly displaced to the concave surface, one cell thick throughout and with a poorly defined stalk. (Fig. 1.)

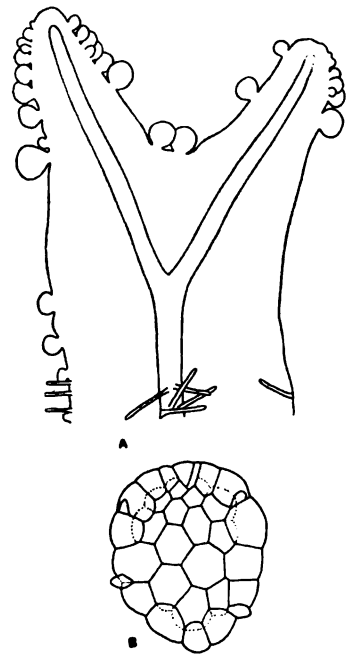

Figure 1.—METZGERIA SCYPHIGERA Evans

A. Tip of a gemmiparous thallus, × 40. B. Gemma at time of separation, × 60. The figures were drawn from the type specimen.

As pointed out by the writer a few years ago the gemmae in the genus *Metzgeria*[1] often yield characters of specific value, and sometimes make it possible to distinguish between closely related species. In *M. scyphigera* the gemmae are among the simplest that have been described. In their development they agree in all essential respects with the marginal gemmae of *M. furcata* (L.) Dumort., *M. myriopoda* Lindb., and *M. oligotricha* Evans, a marginal cell becoming directly the mother cell of a gemma without undergoing a preliminary division.

[1] Vegetative Reproduction in *Metzgeria*. Ann. Bot. **24**: 271—303. *f. 1—16*. 1910.

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A gemma at maturity consists of a circular or slightly elongated plate of cells with a single apical cell and a short and often indistinct stalk composed of two cells (Fig. 1, B). It is further characterized by being distinctly concave and by bearing a few rudimentary marginal hairs, slightly displaced to the concave surface.

The germination of a gemma is very similar to that described for other species. The concave surface becomes attached to the substratum by means of the rudimentary hairs, which grow out into short rhizoids. The apical cell of the gemma then resumes its divisions and gives rise to a flat strap-shaped thallus, which is at first no wider than the gemma but which gradually becomes wider and differentiates a costa. In rare cases the young plant undergoes a branching by an apparent dichotomy before the costa makes its appearance. It is often quite impossible to determine where the gemma ends and the young thallus begins, but sometimes there is a constriction at the junction between the two. In some cases new marginal gemmae arise, either on the original gemma itself or on the young thallus while still in an undifferentiated condition.

The gemmiparous branches (Fig. 1, A) tend to differ more or less from normal branches. They not only curve away from the substratum but totally lack hairs on both wings and costa. At the same time the wings grow narrower and narrower until they may be only three or four cells wide. With this tapering of a branch its growth soon comes to an end. These modifications resemble somewhat those found in the gemmiparous branches of *M. fruticulosa* (Dicks.) Evans, but apparently they never pass beyond the stages described and never reach the striking conditions sometimes seen in *M. fruticulosa*, where the branch may lose its wings altogether and become reduced to a radial costa bounded by cortical cells and growing at right angles to the substratum. Whether these apparent differences are actual or merely due to an insufficient supply of the new species can hardly be answered at the present time.

In his Species Hepaticarum Stephani[1] describes two dioicous South American species in which the scattered marginal hairs occur singly. They agree further with *M. scyphigera* in the costa, which is bounded both above and below by two rows of marginal cells and which bears hairs on its lower surface. One of these species is *M. chilensis* Steph., of Chile and New Zealand, and the other is M. *aurantiaca* Steph., of Brazil. In *M. chilensis*, however, the thallus is almost revolute, the wings are smooth on the lower surface, the cells measure 54 × 36 μ,

[1] Bull. de l'Herb. Boissier 7: 937, 938. 1899.

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and there are no trigones. In *M. aurantiaca* the wings bear scattered hairs as in *M. scyphigera*, but the thallus is strongly convex, the wings are only twelve cells wide, and there are no trigones. Stephani makes no mention of gemmae in any of his descriptions.

JUNGERMANNIACEAE

IV. **Plagiochila** Dumort.

The genus *Plagiochila* is one of the largest genera of Hepaticae, nearly eight hundred species being recognized by Stephani in his recent monograph.[1] With but few exceptions these species are tropical, and many of them seem to be exceedingly local in their distribution. In spite of their considerable size the species are extremely difficult to determine, the differential characters being often based on the type of branching present, the shape of the leaves, the number and peculiarities of their teeth, the size of the leaf-cells, and the nature of the local thickenings in their walls. The bracts and perianths also yield characters of importance, but the determination of specimens must often be made without the assistance of these organs; in fact they are known in comparatively few species. It will be seen at once that most of the differential characters used are subject to more or less variation, and this of course adds appreciably to the difficulties of gaining a correct comprehension of the species. The present collection contains nine *Plagiochilae* in sufficient quantity to warrant determination; five of these are referred to described species, and the others are proposed as new. It is to be hoped that this course will not add to the confusion already prevalent in the genus.

4. **Plagiochila alternans** Lindenb. & Gottsche

Plagiochila alternans Lindenb. & Gottsche; G. L. & N. Syn. Hep. 648. 1847.

On earth, San Miguel, 5,000–6,000 feet, July 24, 1911; on a damp rock, Lucma, 7,000 feet, August 7, 1911.

Plagiochila alternans was originally described from specimens collected by Liebmann in the province of Oaxaca, Mexico. It was afterwards reported by Spruce from Bolivia, *Rusby*, and Costa Rica, *Hyde*, and by Stephani from Venezuela, *Funck*. The Peruvian specimens agree closely with the published descriptions and also

[1] Bull. de l'Herb. Boissier II. 2–6. 1902–1906.

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with Gottsche's[1] figures, except that the teeth on the leaves are more numerous, numbering from sixty to eighty on robust leaves instead of from twenty-five to forty. This is apparently due to the unusual development of the plants and is hardly sufficient to justify their separation as a distinct species. The present specimens bear a striking resemblance to large forms of *P. asplenioides* (L.) Dumort. and especially to the variety *major*; in the common northern species, however, trigones are always present in the leaf-cells and the teeth are shorter and less spine-like.

5. **Plagiochila andicola** Mont. & Gottsche

Plagiochila andicola Mont. & Gottsche; Montagne, Ann. des Sc. Bot. IV. **6**: 187. 1856.

On live wood, San Miguel, 6,000 feet, July 24, 1911.

The sterile type material of *P. andicola* was collected by Jameson at Quito, Ecuador, and apparently no other stations have been recorded. The present specimens agree with the published descriptions except in two particulars, the plants being a little less robust and the leaf-cells showing slightly larger measurements. According to the descriptions the stems are 7—15 cm. long, the apical leaf-cells measure 18 μ, and the basal cells average 36 × 27 μ. In the Peruvian plants the most robust stems are only 4 cm. long, the apical leaf-cells average about 25 μ, while the basal cells are about 45 × 28 μ. These differences, however, are slight and the measurements compared are variable, so that they afford no adequate basis for a specific separation.

Most of the Peruvian plants are sterile or reproduce by abundant propagula of the usual type. But a few show male inflorescences, which sometimes occur at the base of a branch and sometimes at or near the middle. In other words the male branch always produces normal leaves beyond the perigonial bracts. The latter, in the few cases observed, are in about six pairs and are closely imbricated. Instead of spreading obliquely, as do the normal leaves, they are suberect and only the apical portion is more or less squarrose. As in all typical species of *Plagiochila* the antical basal portion is strongly inflated and delicate in texture. The rest of the bract approaches a normal leaf in texture, except that the cells are a little smaller (averaging about 16 μ in the apical portion), and the thickenings of the walls are less pronounced. When a well-developed bract is spread out it is seen to be broadly ovate and strongly unsymmetrical

[1] Mex. Leverm. *pl.* 7. 1863.

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on account of the dilated basal portion. It measures about 1 × 0.9 mm., and the three to five blunt teeth are restricted to the apical region. Two or three antheridia are found in the axil of each bract.

Closely related to *P. andicola*, as Gottsche notes, is the Mexican *P. truncata* Gottsche,[1] originally described from specimens collected by Liebmann in the Sempoaltepec region and afterwards found by other collectors. In this species the apices of the leaves tend to be truncate, although in some of Gottsche's figures this condition is not pronounced, and the teeth are longer and sharper than in *P. andicola*. In *P. subconvoluta* Gottsche[2], another Mexican species known only from a single specimen found by an unknown collector, the leaves are much like those in *P. andicola* and *P. truncata*, but the postical bases are not dilated in such a way that they forms crests.

6. **Plagiochila Binghamiae** sp. nov.

On rocks, Huadquiña, 5,000 feet, July 30, 1911. Named in honor of Mrs. Alfreda Mitchell Bingham, a patroness of the Expedition.

Yellowish or brownish green, not glossy, growing in loose mats: stems mostly 2—3 cm. long and 0.3 mm. in diameter, more or less rigid, ascending, simple or with an occasional branch, the branches obliquely spreading, almost invariably intercalary, similar to the stem but often with somewhat smaller leaves: leaves alternate, contiguous or loosely imbricated, widely spreading (at an angle of about 75 degrees), somewhat convex, ovate, 1.5—2.4 mm. long, 0.9—1.2 mm. wide, narrowly decurrent both antically and postically, antical margin somewhat revolute toward the base, slightly incurved to slightly outcurved, entire, postical margin more or less involute in decurrent portion and for a variable distance beyond, sometimes as far as the middle, outwardly curved but not dilated at the base, entire or with a single tooth in the outer part, apex broad and rounded with three or four scattered teeth, the latter irregular, mostly four or five in all, usually three or four cells long and three or four cells wide at the base, abruptly pointed; leaf-cells averaging 17 μ in the apical region, 28 × 19 μ in the middle, and 32 × 23 μ at the base, walls thin but with distinct triangular trigones, one or two of the sides usually bulging, intermediate thickenings few, oval, thickenings often confluent, especially toward the base and along the margin; cuticle smooth: underleaves minute, about 0.1 × 0.07 mm., deeply cleft almost to the base into two to four cilia: propagula numerous, with small leaves: remaining parts not seen. Fig. 2.

Although most of the branches in this species are intercalary a terminal branch is occasionally produced and is of considerable

[1] Mex. Leverm. 127. *pl. 10. f. 1—4.* 1863.

[2] Mex. Leverm. 120. *pl. 3, f. 1—10.* 1863.

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theoretical interest. Apparently here, as in so many species of *Plagiochila*, terminal branches have been supplanted by intercalary branches, and the appearance of a terminal branch is to be looked upon as a reversion. It is perhaps associated with a vigorous growth and a retention of a juvenile condition, much as in the cases described by the writer under *Cephalozia bicuspidata* (L.) Dumort. and *Lophocolea heterophylla* (Schrad.) Dumort.[1]

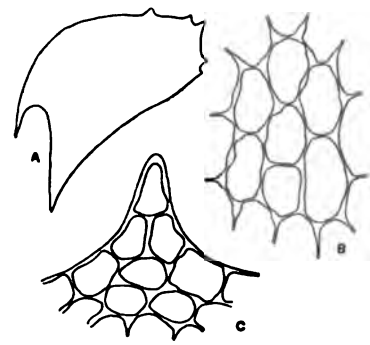

Figure 2.—PLAGIOCHILA BINGHAMIAE Evans

A. Leaf, dissected from the stem, × 17. B. Cells from the middle of a leaf, × 300. C. Tooth from near the apex of a leaf, × 300. The figures were drawn from the type specimen.

Closely related to *P. Binghamiae* is a sterile Ecuador plant collected by Spruce and described by him under the name *P. hypantra*.[2] In this species terminal branches although infrequent are the rule rather than the exception. The leaves are similar in form to those of *P. Binghamiae* but the teeth, especially those in the apical region, are longer and sharper The leaf-cells are characterized by less robust thickenings. In *P. patentissima* Steph.,[3] a Peruvian species collected by Lechler at St. Gavan and known to the writer from description only, the leaves bear from eleven to thirteen spines, those near the apex being especially large and acuminate. It differs further from *P. Bighamiae* in the size of the leaf-cells, those in the middle of the leaf measuring 54 × 27 μ and those at the apex 36 × 27 μ.

7. **Plagiochila chinantlana** Gottsche

Plagiochila chiantlana Gottsche, Mex. Leverm. 12. *pl. 5, f. 1–7.* 1863.

San Miguel, 5,000–6,000 feet, July 24, 1911.

The Peruvian material agrees pretty closely with the specimens collected by Pringle at Patzcuaro, Mexico, and distributed by Underwood and Cook in their Hepaticae Americanae, No. 110. The species was first collected in the province of Oaxaca, Mexico, by Liebmann. According to Spruce it has been found also by Cross at San Sebastiano, Colombia, but Stephani does not record its occurrence outside of Mexico.

[1] Ann. Bot. **26**: 33. 1912. [2] Hep. Amaz. et And. 465. 1885.
[3] Bull. de l'Herb. Boissier II. **2**: 877. 1902.

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8. **Plagiochila flavescens** Gottsche

Plagiochila Guilleminiana β flavescens G. L. & N. Syn. Hep. 644. 1847.

Plagiochila flavescens Gottsche, Mex. Leverm. 148. *pl. 7, f. 1–3.* 1863.

On live wood, Lucma, 7,000 feet, August 7, 1911.

Originally collected by Liebmann in the province of Oaxaca, Mexico, and later reported by Jack and Stephani from either Colombia or Peru, in their account of Wallis's Hepaticae.[1] The determination of the material from Lucma is based on the figures and description of Gottsche. The plants bear a strong resemblance to *P. Guilleminiana* Mont., a species listed below, but are somewhat more robust. The leaves, moreover, are relatively broader, the dilated portion at the postical base being very conspicuous and forming striking crests. The leaves measure about 4 mm. in length (including the dilated portions) and about 3 mm. in width. Leafy propagula are present in abundance.

9. **Plagiochila Footei** sp. nov.

San Miguel, 5,000–6,000 feet, July 24, 1911. Named in honor of Professor Harry Ward Foote, the collector.

Pale green, varying to brownish green, not glossy, growing in loose tufts: stems mostly 3–6 cm. long and 0.35 mm. in diameter, more or less rigid, simple or sparingly branched, the branches all intercalary, similar to the stem but sometimes with somewhat smaller leaves: leaves subopposite, distant to subimbricated, obliquely spreading (at an angle of about 45 degrees), strongly convex, broadly ovate, about 2 mm. long and 1.6 mm. wide, narrowly decurrent both antically and postically, the antical margin extending a little farther backward than the postical, antical margin slightly revolute toward the base, straight or somewhat outwardly curved, entire, postical margin strongly outwardly curved from the narrow decurrent portions, sharply dentate-ciliate, apex rounded with more crowded teeth than the postical margin; total number of teeth mostly twelve to fifteen, unequal, acuminate, mostly three to six cells long and one to four cells broad at the base; leaf-cells plane, averaging 22 μ at the apical margin, 35 × 30 μ in the middle, and 50 × 25 μ at the base, walls thin but with minute triangular trigones with concave sides; cuticle smooth: remaining parts not seen. (Fig. 3.)

Although at first sight the leaves in this new species appear exactly opposite, closer inspection shows that the decurrent bases on one side of the stem extend a little farther backwards than those on the other, and this is true both antically and postically. The line of insertion

[1] Hedwigia **31**: 14. 1892.

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here, as in allied species, is strongly and narrowly arched, and this peculiarity, associated with the convexity of the leaves, gives the plants a very characteristic appearance. As the leaves become dry they appear more and more revolute and spread from the axis at almost a right angle. When moist they spread more obliquely and show a strong tendency to come into contact postically.

Two South American species are closely related to *P. Footei*. One is *P. oresitropha* Spruce,[1] collected by Spruce in the Andes of Peru and by Rusby in Bolivia, and the other is *P. mapiriensis* Spruce,[2]

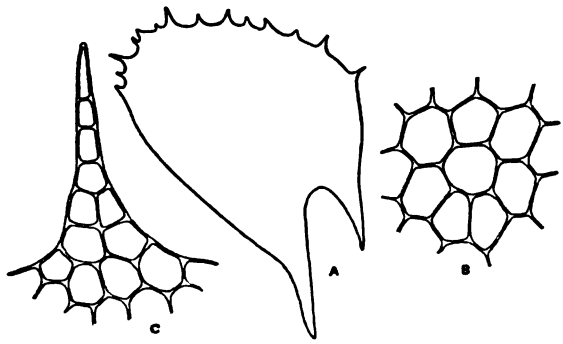

Figure 3.—PLAGIOCHILA FOOTEI Evans

A. Leaf, dissected from the stem, × 17. B. Cells from the middle of a leaf, × 225. C. Tooth from the postical margin of a leaf, × 225. The figures were drawn from the type specimen.

collected by Rusby in Bolivia. According to Stephani *P. mapiriensis* is merely a form of the widely distributed *P. rutilans* Lindenb., but Spruce's description would indicate that he had another species before him. In *P. oresitropha* the general appearance is much the same as in *P. Footei*, the leaves being nearly opposite and spreading widely from the stem. Yet the species is somewhat more robust, and the leaves are larger and closer together. Spruce gives as measurements for the leaves a length of 2.5–3.25 mm. and a width of 2–2.75 mm., the ratio of width to length being a little higher than in *P. Footei*. The leaves show further differences in their teeth and in their cell structure. In *P. oresitropha* the antical margin bears five or six scattered teeth, only the basal portion being entire, while the teeth on the postical and apical margins are more crowded than in the new species. In fact the whole number of teeth on a leaf is approximately

[1] Hep. Amaz. et And. 467. 1885.
[2] Mem. Torrey Club 1: 131. 1890.

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forty. The leaf-cells differ but little in size in the two species, but the thickenings in the wall are much more pronounced in *P. oresitropha*; the trigones have bulging sides and are often elongated at the angles, there are numerous intermediate thickenings (sometimes two on a long lateral wall), and there is more or less coalescence between the thickenings. In *P. Footei*, as noted in the description, the trigones have concave sides, and it may be added that intermediate thickenings are practically lacking and that coalescence apparently never occurs. In *P. mapiriensis*, known to the writer from description only, the leaves are relatively longer than in *P. Footei*, measuring about 2.5 mm. in length and only 1.1–1.4 mm. in width, and the cells are smaller, averaging only 29 μ in diameter; in other respects the two species seem to be closely allied, the number of marginal teeth in *P. mapiriensis* varying from eight to fifteen.

10. **Plagiochila Guilleminiana** Mont.

Plagiochila Guilleminiana Mont.; Lindenberg, Monogr. Hepat. Gen. Plagiochilae 152. *pl.* 33, *f.* 1–4. 1842.

Plagiochila Haeckeriana Lindenb. & Gottsche; G. L. & N. Syn. Hep. 644. 1847.

Plagiochila oreocharis Spruce, Hep. Amaz. et And. 498. 1884.

Plagiochila rhizophila Spruce, *l. c.* 495. 1884.

On live wood, Santa Ana, 3,000 feet, August 4, 1911.

The synonymy given above is taken from Stephani's Species Hepaticarum.[1] Accepted in this broad sense the species is variable and has a wide distribution. It was based on two Brazilian specimens, one collected by Raddi and the other by Guillemin, and was soon afterwards reported from Mexico in the collections of Liebmann. The type-locality of *P. Haeckeriana* is not given definitely by its authors but was apparently somewhere in the Andes, while *P. oreocharis* and *P. rhizophila* were based on material collected by Spruce, the first in Peru and the second in Ecuador. According to Stephani *P. Guilleminiana* has been found also in Guatemala by Wurr and in Colombia by Lindig.

In the present specimens the stems are about 6 cm. long and are simply pinnate, the branches being few and irregular and apparently all of the *Frullania* type.[2] The female inflorescences are borne on the tips of some of these branches. The leaves (Fig. 4) have a length

[1] Bull. de l'Herb. Boissier II. **5**: 356. 1905.

[2] See Evans, Ann. Bot. **26**: 4. 1912.

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of about 3 mm., a width of about 1.8 mm. in the broadest portion, and of about 0.5 mm. in the apical region. They are closely imbricated and long-decurrent both antically and postically; when dissected off and spread out they are seen to be ovate-triangular and markedly unsymmetrical. In their natural position they spread widely from the stem, and those on the opposite sides lie almost in one plane, thus giving the shoot a flattened appearance. The antical margin is plane in the apical region and often along a part of the decurrent portion, otherwise it is more or less revolute and is usually slightly incurved. Occasionally it bears one or two small teeth in the outer part but in most cases is entire throughout its length. The postical margin is crispate and strongly dilated at the base, spreading backward from the stem at almost a right angle and thus forming a part of a postical crest. Beyond the dilated portion it extends almost in a straight line to the apex. On robust leaves the dilated portion sometimes bears a series of scattered spine-like teeth, but it is quite entire in many cases, and this condition seems to be the rule on the leaves of branches and of poorly developed stems. Beyond the middle the postical margin bears a few scattered teeth. The apex is broad and variously rounded, truncate, or acute, depending somewhat upon the number and position of its scattered teeth. The total number of teeth present on a leaf is usually between five and twenty, the higher numbers being found on leaves where the postical base is spinose-dentate. Most of the teeth are from three to five cells in length. On the perichaetial bracts the teeth are more numerous, numbering from twenty-five to thirty and are found not only along the whole postical margin but along

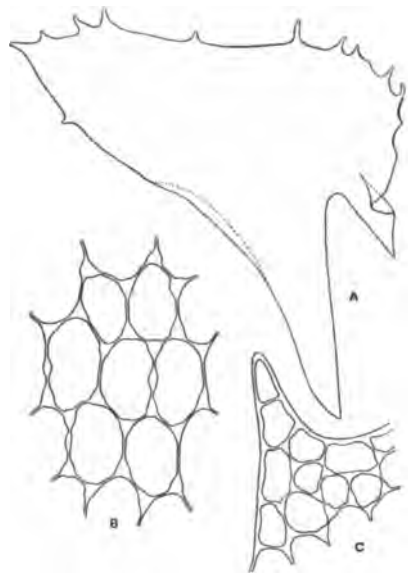

Figure 4.—PLAGIOCHILA GUILLEMINIANA Mont.

A. Leaf, dissected from the stem, × 17.
B. Cells from the middle of a leaf, × 300.
C. Tooth from the postical margin of a leaf near the apex, × 225. The figures were drawn from the specimens collected at Santa Ana.

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a considerable part of the antical margin as well. Many of these teeth are distinctly spinose in character. The leaf-cells have distinct triangular trigones with bulging sides. Toward the base occasional oval intermediate thickenings make their appearance, and, especially in the antical portion, there is a tendency toward a coalescence of the thickenings.

The specimens just described agree in most respects with those distributed by Spruce under the name *P. oreocharis*, although the latter are a little less robust. The trigones in Spruce's plants, however, are a little larger, and the thickenings show a stronger tendency to coalescence throughout the leaf. Stephani comments on the great variability in the number of teeth found on vegetative leaves, but emphasizes the fact that the perichaetial bracts and the perianths present characters of more constancy.

11. **Plagiochila pauciramea** sp. nov.

On damp earth and wood, Lucma, 7,000 feet, August 7, 1911.

Yellowish to brownish green, not glossy, growing in loose tufts: stems mostly 5—6 cm. long and 0.45 mm. in diameter, flexuose, ascending, sparingly and irregularly branched, the branches all terminal, of the Frullania type, sometimes irregularly subdivided, obliquely spreading, similar to the stem but often shorter and with smaller leaves: leaves alternate, loosely imbricated, obliquely spreading (at an angle of about 60 degrees), antical portion more or less convex near the base, otherwise plane or nearly so, ovate, about 3 mm. long and 2.3 mm. wide, long-decurrent antically, more shortly and narrowly decurrent postically, antical margin a little revolute near the base, slightly outwardly curved or nearly straight, entire at the base but bearing from two to four spinose teeth beyond the middle, postical margin narrowly revolute in the decurrent portion and slightly beyond, more strongly outwardly curved, entire at the base but bearing about ten spinose teeth scattered throughout the greater part of its length, apex broad and rounded with about five spinose teeth; total number of teeth mostly fifteen to twenty, slender and acuminate, mostly four to ten cells long and one to four cells wide at the base, the larger teeth irregularly distributed but tending to be more numerous in the outer part of the leaf; leaf-cells plane, averaging about 25 μ at the apex, 45 $\times$ 30 μ in the middle, and 55 $\times$ 30 μ at the base, walls appearing uniformly thickened on account of the fact that the thick outer walls extend down upon the vertical walls, the latter upon careful focusing appearing thin but showing small trigones with straight or slightly bulging sides and very rare oval intermediate thickenings; cuticle smooth: underleaves about 0.15 mm. long and 0.12 mm. wide, divided almost to the base into four to eight slender cilia: remaining parts not seen. (Fig. 5.)

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In spite of the few and irregular branches in *P. pauciramea*, it belongs to Spruce's section *Frondescentes* and has several relatives among the species already known from South America. *P. montana* Spruce, from Campana, Peru, is one of these, but in this species the leaves narrow more markedly toward the apex than in *P. pauciramea*, the spines are shorter and broader, the walls of the leaf-cells do not appear uniformly thickened, and there are no conspicuous underleaves. In *P. amazonica* Spruce, another allied species of the Amazonian Plain, extending up the eastern slopes of the Andes, the margin of the leaves is spinose throughout, even at the antical base, and the spines are more numerous, numbering about forty in all. In this species, further, the leaves are subtriangular in outline, both antical and postical margins tending to straight in the outer part. Both *P. montana* and *P. amazonica* are known to the writer from specimens distributed by Spruce.

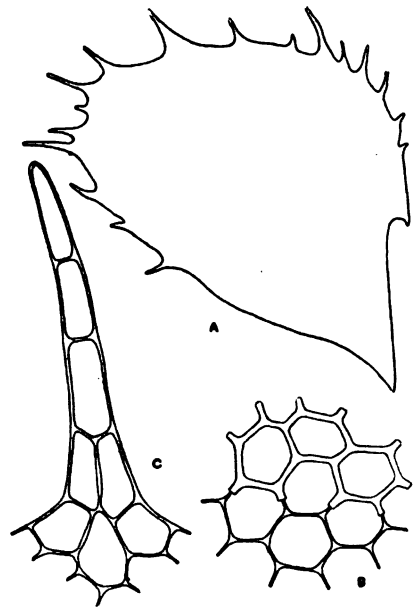

Figure 5.—PLAGIOCHILA PAUCIRAMEA Evans A. Leaf, dissected from the stem, × 17. B. Cells from the middle of a leaf, those in the lower part of the figure drawn at a lower focus, × 225. C. Tooth from near the middle of the postical margin of a leaf, × 225. The figures were drawn from the type specimen.

12. **Plagiochila striolata** sp. nov.

On dead wood, Lucma, 7,000 feet, August 7, 1911.

Yellowish to brownish green, not glossy, growing in compact tufts: stems mostly 1.5—2 mm. long, about 0.25 mm. in diameter, rigid, ascending, sparingly and irregularly branched, the branches all intercalary, obliquely spreading, very rarely subdivided, similar to the stems but usually with smaller leaves: leaves alternate, contiguous to loosely imbricated, obliquely spreading (at an angle of about 60 degrees), antical portion more or less convex toward the base, postical portion slightly concave, apical portion plane

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or nearly so, broadly ovate, about 1.5 mm. long and 1.2 mm. wide, slightly or not at all decurrent antically, shortly decurrent postically, antical margin more or less revolute (on well-developed leaves), slightly outwardly curved, entire, postical margin strongly outwardly curved from the short and narrow decurrent portion, sharply dentate-spinose, apex broad and rounded, similarly dentate-spinose; total number of teeth mostly ten to twelve, unequal, usually two to five cells long and one to three cells wide at the base, teeth in the apical region tending to be larger than the others; leaf-cells plane, averaging about 20 μ in the apical region, 25 × 20 μ in the middle, and 35 × 20 μ at the base, walls with large triangular trigones usually with bulging sides, and (especially toward the base) occasional oval intermediate thickenings, coalescence between thickenings rare except near the margin; cuticle minutely striolate-verruculose: remaining parts not seen. (Fig. 6.)

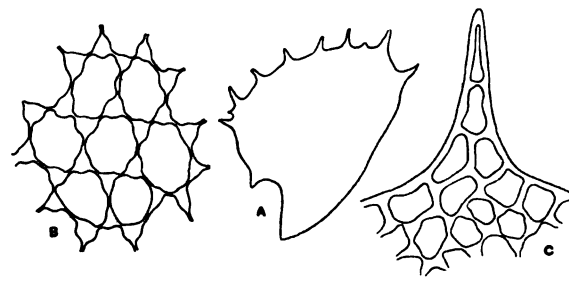

Figure 6.—PLAGIOCHILA STRIOLATA Evans

A. Leaf, dissected from the stem, × 17. B. Cells from the middle of a leaf, × 300. C. Tooth from near the middle of the postical margin of a leaf, × 225. The figures were drawn from the type specimen.

Although roughened cuticles are frequently found in many genera of the Hepaticae they have rarely been associated with definite species of *Plagiochila*. Stephani, however, has recently described two South American species in which this peculiarity occurs. These are *P. asperifolia* Steph., collected by Puiggari and Ule in Brazil, and *P. verrucosa* Steph., collected by Funck and Schlim in Venezuela. Unfortunately these species are known to the writer from description only, but are evidently distinct from *P. striolata*. The first is somewhat more robust, the leaves being about 2 mm. long. It is further distinguished by its obliquely truncate leaves with three apical spines, the anterior one being usually much larger than the others. The second species is still larger, the leaf-cells are only 12 μ wide at the apex and only 36 × 12 μ in size at the base, while the cuticle is coarsely verruculose. The spines in this species are furthermore said to show a distinct increase in size not only toward the apex but also toward the postical base.

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V. **Lophocolea** Dumort.

13. **Lophocolea diaphana** Spruce

Lophocolea diaphana Spruce, Hep. Amaz. et And. 426. 1884.

On wet earth, San Miguel, 6,000 feet, July 24, 1911.

The specimens are sterile and fragmentary, and their reference to the present species is open to some doubt. *L. diaphana* was collected by its author at several localities in Ecuador and was afterwards distributed in his exsiccatae. In the set examined by the writer the leaf-cells show minute trigones, although these are not mentioned in Spruce's description. In the specimens from San Miguel there are no trigones, but this might very well be owing to the poor development of the plants.

VI. **Radula** Dumort.

14. **Radula andicola** Steph.

Radula andicola Steph. Hedwigia **23**: 114. 1884.

Radula viridi-aurea Spruce, Hep. Amaz. et And. 324. 1885.

On rocks, San Miguel, 5,000 feet, September 2, 1911.

A few fragments only but apparently referable to this species. The plants are sterile except for the presence of discoid gemmae, which are similar to those found in *R. complanata* (L.) Dumort. *R. andicola* was based on three specimens, the first collected by Krause in Ecuador, the second by Birschall in Venezuela, and the third by Deventer in Brazil; the original material of *R. viridi-aurea* was collected by Spruce in Ecuador. In his recent synopsis of the genus *Radula* Stephani[1] reduces Spruce's species to synonymy, and ascribes a still wider distribution to the plant, quoting it also from Cuba, Costa Rica, Colombia, Peru, and Bolivia.

15. **Radula ramulina** Tayl.

Radula ramulina Tayl. Jour. Bot. **5**: 374. 1846.

On rocks, San Miguel and vicinity, 5,000–6,000 feet, July 24 and September 3, 1911.

A large and conspicuous species, pale yellowish in color and growing in depressed mats. The original material was collected by Jameson in the province of Pichincha, Ecuador. Spruce collected it repeatedly in the same country, and it has also been definitely reported from Bolivia. Stephani gives no precise localities for the species but states that it is abundant in the Andes.

[1] Sp. Hepat. **4**: 174. 1910.

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VII. **Porella** L.

16. **Porella arborea** (Tayl.) Trevis.

Madotheca arborea Tayl. Jour. Bot. **5**: 379. 1846.
Porella arborea Trevis. Mem. R. Ist. Lomb. III. **4**: 407. 1877.
On earth, San Miguel, 5,000–6,000 feet, July 24, 1911.

The specimens are sterile but agree pretty closely with those collected by Spruce at Tunguragua, Ecuador, and distributed in his exsiccatae. The original material of the species was found by Jameson in the province of Pichincha, Ecuador. According to Stephani it is abundant in the Peruvian Andes.

17. **Porella squamulifera** (Tayl.) Trevis.

Madotheca squamulifera Tayl. Jour. Bot. **5**: 378. 1846.
Porella squamulifera Trevis. Mem. R. Ist. Lomb. III. **4**: 407. 1877.
On wood, Lucma, 7,000 feet, August 7, 1911.

The specimens, which are sterile, have been carefully compared with those collected by Spruce at Pangor, Ecuador, and distributed in his exsiccatae. Although the Peruvian material does not agree very closely with Spruce's specimens in general habit, no structural differences could be demonstrated, and it therefore seems advisable to refer them to *P. squamulifera*, at least provisionally, rather than to try to separate them as a distinct species. The type material of *P. squamulifera* was collected by Jameson in the province of Pichincha, Ecuador, and according to Stephani the species occurs in the Andes of Peru.

VIII. **Microlejeunea** (Spruce) Jack & Steph.

18. **Microlejeunea bullata** (Tayl.) Evans

Lejeunea bullata Tayl. Jour. Bot. **5**: 398. 1846.
Microlejeunea bullata Evans, Mem. Torrey Club **8**: 164. *pl. 21, f. 20–29.* 1902.
On rocks, Santa Ana, 3,000 feet, August 4, 1911.

The specimens are sterile and in very small amount but are apparently correctly determined. *M. bullata* is a widely distributed species, originally described from material collected by Guilding on the island of St. Vincent. It is now known also from South Carolina, from Florida, from several additional islands in the West Indies, and (according to Spruce) from numerous localities in Ecuador.

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IX. **Taxilejeunea** (Spruce) Schiffn.

19. **Taxilejeunea debilis** (Lehm. & Lindenb.) Schiffn.

Jungermannia debilis Lehm. & Lindenb.; Lehmann, Pug. Plant. **4**: 51. 1832.

Lejeunea debilis Lehm. & Lindenb.; Nees & Montagne, Ann. des Sc. Nat. Bot. II. **5**: 60. 1836. Montagne, Fl. Boliv. in d'Orbigny, Voy. dans l'Amér. Mérid. **7**[2]: 63. *pl. 1, f. 2.* 1839.

Omphalanthus debilis Lehm. & Lindenb.; G. L. & N. Syn. Hep. 306. 1845.

Lejeunea (*Taxi-Lejeunea*) *debilis* Steph. Hedwigia **29**: 12. 1890.

Taxilejeunea debilis Schiffn. Bot. Jahrb. **23**: 579. 1897.

On earth, San Miguel, 5,000–6,000 feet, July 24, 1911.

A pale and delicate species growing in loose tufts. Widely distributed in the American tropics from the West Indies, through Mexico and Colombia, to Peru and Bolivia. The original material came from the island of St. Vincent, collector's name unknown. The specimens in the present collection have perianths and are in excellent condition.

20. **Taxilejeunea florida** (Spruce) Steph.

Lejeunea (*Taxi-Lejeunea*) *florida* Spruce, Hep. Amaz. et And. 221. 1884.

Taxilejeunea florida Steph. Sp. Hep. **5**: 467. 1914.

Ollantaytambo, 9,000 feet, July 21, 1911.

This species was based on material collected by Spruce in the Andes of Ecuador. Unfortunately the Peruvian specimens lack perianths, but they show both male and female inflorescences and agree closely with Spruce's full description.

21. **Taxilejeunea pterogonia** (Lehm. & Lindenb.) Schiffn.

Jungermannia pterogonia Lehm. & Lindenb.; Lehmann, Pug. Plant. **6**: 44. 1834.

Omphalanthus pterogonius Lehm. & Lindenb.; G. L. & N. Syn. Hep. 306. 1845.

Omphalanthus subalatus Lindenb. & Gottsche; G. L. & N. Syn. Hep. 747. 1847.

Lejeunea (*Taxi-Lejeunea*) *pterogonia* Spruce, Hep. Amaz. et And. 216. 1884.

Taxilejeunea pterogonia Schiffn.; Engler & Prantl, Nat. Pflanzenfam. **1**[3]: 125. 1895.

On earth, San Miguel, 5,000–6,000 feet, July 24, 1911.

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The specimens are sterile but are apparently referable to this species. It was originally described from Peruvian material in the herbarium of Kunze. It is now known to have a wide distribution in tropical America and has been reported from Mexico, Colombia, Brazil, and Ecuador, as well as from Peru.

X. **Dicranolejeunea** (Spruce) Schiffn.

Several genera of the Lejeuneae have recently been discussed at length by the writer in connection with the Hepaticae of Porto Rico. Since *Dicranolejeunea* has not yet been detected on that island the present opportunity is taken of calling attention to its peculiarities. So far as known the genus is entirely tropical in its distribution. In his Species Hepaticarum Stephani recognizes three species from Africa, three from Asia, and twenty-two from North and South America, thus showing its preponderance in neotropical regions. The species flourish best at relatively high altitudes, altough a few have been reported from near the sea level. The bark of trees is the favorite habitat for the majority of the species; a few grow on the leaves of woody plants or on rocks; while others form more or less compact tufts on banks rich in humus. Sometimes a species is able to grow on several substrata.

Under favorable conditions the plants show a yellowish or brownish pigmentation. Apparently in all cases the stems are at first prostrate, and oftentimes this habit is retained through life. In other cases the prostrate stems give rise to erect, ascending, or pendulous branches, or secondary stems, which become subdivided and continue their growth indefinitely. Under these circumstance it may become difficult or impossible to demonstrate the prostrate stems at all. A similar distinction between a primary prostrate axis and secondary stems occurs in many genera of the Hepaticae, such as *Porella*, *Mastigolejeunea*, and *Bryopteris*. Sometimes it represents a constant feature of an entire genus; sometimes, as in *Dicranolejeunea*, it is restricted to certain species.

The branching in *Dicranolejeunea* is of two types, just as in *Stictolejeunea*, *Bryopteris*, and most species of *Brachiolejeunea*. The *Frullania* type, in which a leaf without a lobule is situated at the base of the branch, occurs on robust shoots and is associated with vigorous growth (Fig. 7, B; 8, C.). The *Radula* type, in which the leaf at the base of the branch bears a distinct lobule, occurs on older shoots, especially where the development of reproductive organs brings about a retardation or cessation of growth.

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Apparently the subfloral innovations are invariably of this type (Fig. 7, A; 8, A). In branches of the *Frullania* type the first underleaf of the branch is either undivided or bifid and is displaced in such a way that the branch seems to arise in its axil. The first leaf on such a branch is rudimentary and very small but the succeeding leaves show normal features.

The leaves vary from loosely to closely imbricated (Figs. 7, 8). As the plants become dry the lobes tend to assume a suberect position and often wrap themselves around the stem, very much as in *Mastigolejeunea* and *Brachiolejeunea*. When water is supplied the lobes become more or less flattened out and form an angle of forty-five degrees or more with the axis. In general outline the lobes are ovate and narrow to an acute, obtuse, or even rounded apex; they are plane or slightly convex, and in certain species the postical margin tends to be revolute; the margin is either entire or sharply and irregularly dentate.

The lobule shows a more or less arched keel and is strongly inflated. In some cases the inflated portion involves the entire lobule, the free margin being involute except in the region of the sinus, where the opening into the water-sac is situated. In other cases the inflated portion lies along the keel and the free margin is appressed to the lobe. In the various species examined by the writer the free margin has normally borne two teeth, and these may be distinguished as the apical tooth and the proximal tooth respectively, the proximal tooth being situated between the apical tooth and the basal end of the margin. In poorly developed leaves the proximal tooth may be indistinct or even obsolete. The apical tooth is usually large and sharp, being two or three cells long and one or two cells wide at the base (Fig. 7, D, E); sometimes the tip cell becomes divided by a longitudinal wall (Fig. 8, G). The hyaline papilla is situated at the proximal base of this tooth but displaced to the inner surface of the lobe, usually two cells from the margin. Beyond the apical tooth the long and shallow sinus extends to the end of the keel. The proximal tooth is invariably shorter and less complex than the apical tooth (Fig. 8, H.). In many cases both teeth bend inward toward the lobe, making it impossible to determine their true structure without dissection. In certain respects the lobules just described agree in structure with those found in *Brachiolejeunea*, *Ptychocoleus*, and *Odontolejeunea*.

The leaf-cells (Fig. 8, F) have thin walls, small trigones, and occasional intermediate thickenings, much more numerous in

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certain species than in others. Sometimes the trigones are so poorly developed that it is difficult to demonstrate them.

The underleaves are undivided and vary in outline from oblong to orbicular or even reniform. They are attached by an arched line, the base is cuneate and often decurrent, and the margin is quite entire and either plane or more or less revolute. The rhizoids when present arise from a very rudimentary disc.

According to Spruce the inflorescence in *Dicranolejeunea* is typically paroicous, although he admits that a dioicous inflorescence sometimes occurs. Stephani describes paroicous, autoicous, and dioicous species. In all the last, however, he admits that the male inflorescence is unknown. The great difficulty in demonstrating the vestiges of antheridia in paroicous species after the sperms have been discharged makes it possible that some, if not all, of the species described as dioicous may in reality be paroicous. It should also be remembered that certain monoicous species occasionally produce individuals in which antheridia but no archegonia are present.

The female inflorescence is sometimes borne on a leading branch and sometimes on a more or less abbreviated branch. In almost every case two subfloral innovations are developed below a primary inflorescence, although occasionally only one is present (Figs. 7, 8). The innovations are usually short and are often terminated by secondary inflorescences. These in turn may develop new innovations upon which tertiary inflorescences may arise, but no cases have been observed in which inflorescences of a higher order have occurred. The innovations are typically in pairs, even in connection with secondary or tertiary inflorescences, but single innovations are more frequent in such cases than in connection with a primary inflorescence.

The perichaetial bracts (Figs. 7, F—K; 8, I—K) are usually distinctly smaller or at least narrower than the leaves. The lobes show a stronger tendency to be toothed, and dentate bracts occur in certain species where the vegetative leaves are entire. The lobules are rarely well developed. In most cases they are exceedingly minute and may even be reduced to a hyaline papilla. The bracteoles are usually larger and broader than ordinary underleaves, but they show less tendency to be toothed than do the lobules of the bracts.

The perianth (Figs. 7, 8) yields several of the more important characters of the genus. It is distinctly compressed and the sharp lateral keels bear dentate or spinose wings variable in width. The antical surface is sometimes plane, sometimes slightly concave, and sometimes bears a very low keel without either wing or teeth.

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The postical surface, theoretically at least, bears two low dentate or spinose keels, but these are often coalescent so that only a single median keel appears to be present, and the teeth or spines may be few or absent altogether.

The male inflorescence in paroicous species occupies a variable length of the fertile branch below the archegonium. The perigonial bracts differ scarcely if at all from the ordinary leaves, except for the presence of the single antheridium enclosed within the lobule. The perigonial bracteoles agree in all respects with the underleaves on ordinary vegetative shoots. In autoicous species the male inflorescence occupies a branch of variable length. The bracts are monandrous, closely imbricated, and much smaller than ordinary leaves. The reduction in size affects the lobes most strongly, these being but little larger than the lobules. The bracteoles are likewise smaller than ordinary underleaves and extend the whole length of the inflorescence.

When compared with the other genera of the Lejeuneae, *Dicranolejeunea* is seen to be especially close to *Odontolejeunea*, in its restricted sense.[1] In both genera the lobes of the leaves tend to be more or less toothed, although species with entire leaves are included in *Dicranolejeunea*; in both genera the free margin of the lobule bears one or more teeth, the number being two in all the known species of *Dicranolejeunea* and varying from one to four in *Odontolejeunea*; in both genera the hyaline papilla of the lobule is situated at the base of the apical tooth on the surface turned toward the lobe; in both genera the leaves lack ocelli, and the leaf-cells have pigmented walls with local thickenings. They agree further in their undivided underleaves, entire in *Dicranolejeunea* and either entire or variously toothed in *Odontolejeunea*; in the small or obsolete lobules of their perichaetial bracts; and in their compressed perianths with dentate wings on the narrow lateral keels. It is difficult, indeed, to separate the genera by characters which are both constant and significant, although each comprises a group of closely related species. It should be noted, however, that the branching in *Odontolejeunea* is always of the *Radula* type, that the subfloral innovations are always single, that the perigonial bracts are typically diandrous, and that the radicelliferous discs on the underleaves are well developed. In *Dicranolejeunea* both the *Radula* and the *Frullania* types of branching occur, the subfloral innovations are typically in pairs, the perigonial bracts seem to be constantly monandrous, and the radicelliferous discs are either

[1] See Evans, Bull. Torrey Club **31**: 183. 1904.

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absent altogether or very rudimentary. *Odontolejeunea* is further distinguished by the occurrence of specialized caducous branches, which multiply the plants vegetatively; in *Dicranolejeunea* no method of vegetative reproduction has been observed. Of course the species of *Dicranolejeunea* in which secondary stems arise from a prostrate primary stem differ markedly in habit from all the species of *Odontolejeunea*, in which the plants always cling closely to the substratum, but they differ in the same way from the species of *Dicranolejeunea* in which a prostrate habit is retained through life.

Two species of *Dicranolejeunea* occur in the present collection. One is the type of the genus, *D. axillaris* (Nees & Mont.) Schiffn.; the other is apparently undescribed.

22. **Dicranolejeunea axillaris** (Nees & Mont.) Schiffn.

Lejeunea axillaris Nees & Mont. Ann. des Sc. Nat. Bot. II. **5**: 59. 1836.

Lejeunea (*Dicrano-Lejeunea*) *axillaris* Spruce, Hep. Amaz. et And. 139. 1884.

Dicranolejeunea axillaris Schiffn.; Engler & Prantl, Nat. Pflanzenfam. **1**[3]: 128. 1895.

San Miguel, 5,000–6,000 feet, July 24, 1911; a few fragments only, mixed with *Plagiochila chinantlana*.

This common and variable species was originally described from Bolivian specimens collected by d'Orbigny. Its known range extends from the West Indies and Mexico, through Central America and the Andes, into Chile. It has been recorded also from the Galapagos Islands. Since the published descriptions are not altogether in accord, even on essential points, a full account of the plant will perhaps be useful.

According to Spruce[1] the leaves are contiguous to subimbricated, the apex of the lobe bears three or more sharp teeth, the margin of the lobule is unidentate, the leaf-cells are thickened at the angles (and rarely in between), the inflorescence is paroicous, and the postical surface of the perianth is either smooth or else bears one or two cilia near the apex. According to Stephani[2] the leaves are imbricated, the apex of the lobe is broadly acuminate-acute and a few teeth are borne below the apex, the lobule is obliquely truncate at the apex with an acute angle, the leaf-cells have no trigones, the inflorescence is monoicous, the small androecia, sessile on the stem,

[1] Hep. Amaz. et And. 139. 1884.

[2] Sp. Hep. **5**: 164. 1912.

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bear from four to eight pairs of bracts, and the postical keel of the perianth is smooth.

From the study of a series of specimens from various localities it has become evident that some of these discrepancies are due to

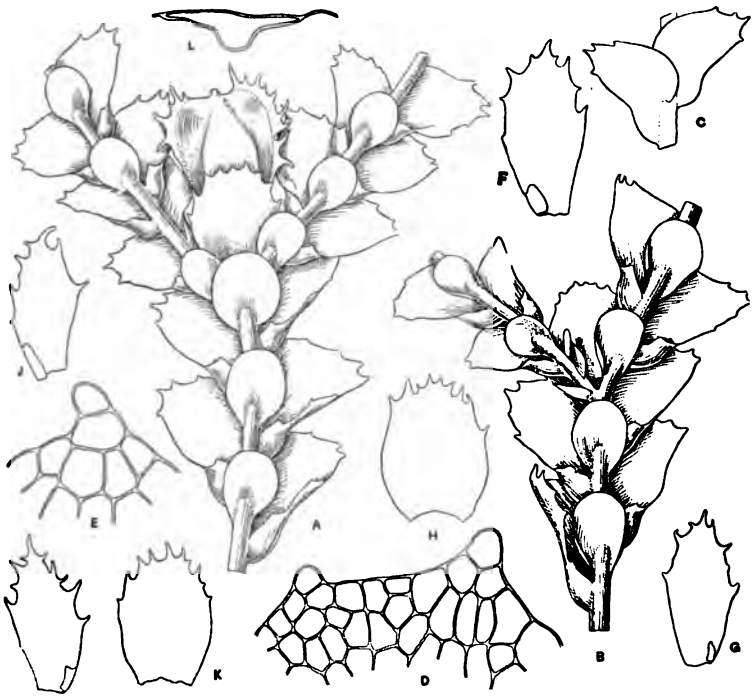

Figure 7.—DICRANOLEJEUNEA AXILLARIS (Nees & Mont.) Schiffn.

A. Part of a secondary shoot, showing a primary inflorescence with perianth and the bases of two innovations, postical view, × 17. B. Part of a secondary shoot, showing the base of a branch of the *Frullania* type, postical view, × 17. C. Two leaves, antical view, × 17. D. Part of a lobule, showing the two marginal teeth, × 225. E. Apical tooth of another lobule, × 225. F.—H. Bracts and bracteole from a primary inflorescence, × 27 I.—K. Bracts and bracteole from a secondary inflorescence, × 27. L. Transverse section of a perianth in upper third, × 40. The figures were drawn from specimens collected by Spruce in the Andes of Ecuador and distributed in his exsiccatae.

the variability of the species, but that others can hardly be explained in this way. The writer finds that the leaves are sometimes rather closely imbricated (Fig. 7, A–C) and that sometimes they scarcely overlap at all. The lobes taper gradually and are sharply pointed

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at the apex. Sometimes, except for this apical tooth, the margin is quite entire, but it is much more usual for the lobe to bear from one to five supplementary teeth in the vicinity of the apex. These teeth tend to be more numerous along the antical margin, but some of them are occasionally situated on the postical margin. In most cases the apical tooth is distinctly larger than the others, but this is not always the case, the antical tooth next the apex sometimes approaching or equalling the apical tooth in size. Under these last circumstances the apical tooth is less conspicuous than on most leaves.

The true lobular features can not always be made out without dissection. If this is done the lobules are found to conform pretty closely with Spruce's description, although it should be noted that neither he nor Stephani makes any mention of the proximal tooth. The apical tooth of the lobule is short and rather sharp, being tipped by a single cell or by two superimposed cells; in other words it is usually two cells long and one or two cells wide at the base (Fig. 7, D, E). Just below the tooth four or five cells are usually connected with the basal cell or cells. The proximal tooth is short and consists of little more than a single projecting cell. Apparently trigones are always present, but they may be very inconspicuous with concave sides. Even when better developed they are less striking than in most members of the Lejeuneae Holostipae.

With regard to the inflorescence it is extremely difficult to demonstrate antheridia or their vestiges after the sperms have been set free and especially after perianths and sporophytes have developed. It is only on very young fertile shoots, where the innovations have just begun to grow, where the archegonium is still unfertilized, and where the perichaetial bracts and bracteole are only partially developed, that the antheridia show clearly. In typical cases there about eight pairs of perigonial bracts just below the female inflorescence. As might be expected delicate and etiolated plants sometimes develop antheridia but no archegonia. This is shown particularly well in material collected by A. Stewart on Albemarle Island, one of the Galapagos group. In some plants from this collection certain stems or leading branches bear a series of perigonial bracts and then continue their growth as ordinary vegetative shoots. This may perhaps be considered an example of reversion, due to the fact that the conditions are not very favorable for the development of reproductive organs.

Spruce's description of the perianth and bracts (Fig. 7, F–L) is unusually full and accurate. The postical keel of the perianth, as he remarks, is low and usually smooth. But this appearance is not

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altogether constant. In some cases it bears long cilia, similar to those on the lateral wings. These cilia are never numerous—from one to three in most cases—and, when more than one, often occur in two rows, representing the angles of the two coalescent postical keels. In most cases the postical cilia are close to the apex, but they may be situated as far back as the middle of the perianth. Apparently they are never borne on wings.

In *D. hypoacantha* (Spruce) Steph.,[1] known only from Pallatanga, Peru, where it was collected by Spruce, *D. axillaris* has a very close ally. In fact the validity of *D. hypoacantha* as a species may be considered doubtful. The two species are of about the same size and agree closely in their leaves, underleaves, bracts, and bracteoles. The leaves in *D. hypoacantha*, to be sure, occasionally have more teeth, as many as eight in extreme cases, but usually the number is no higher than in *D. axillaris*. According to Spruce the inflorescence in *D. hypoacantha* is paroicous, but Stephani describes it as dioicous. No antheridia could be discovered in the material studied by the writer so that neither of these statements could be confirmed. In separating *D. hypoacantha* Spruce relied particularly on characters drawn from the perianths. The form, the beak, and the lateral wings are much the same in the two species, but a typical perianth in *D. hypoacantha* bears narrow spinose wings along the two coalescent postical keels. These are shorter than the lateral wings but resemble them in other respects. Unfortunately this typical condition seems to be very rare. Frequently only one of the postical wings is developed, or else there are no wings at all and the spines grow out directly from the keels. In extreme cases the number of spines may be reduced to only two or three, and the perianths then bear a strong resemblance to those of *D. axillaris*.

23. **Dicranolejeunea rotundata** sp. nov.

On live wood, Santa Ana, 3,000 feet, August 3, 1911.

Brownish green, not glossy, growing in depressed mats: stems about 0.15 mm. in diameter, sparingly pinnate, the branches obliquely to widely spreading, similar to the stem but sometimes with slightly smaller leaves, never microphyllous: leaves imbricated, obliquely spreading, the lobe slightly convex and falcate, ovate, mostly 0.9—1 mm. long and 0.65—0.75 mm. wide, arching part way across the stem, antical margin outwardly curved from the base to the broad and rounded or very bluntly pointed apex, postical margin straight or more or less outwardly curved, margin entire throughout; lobule

[1] Sp. Hepat. 5: 166. 1912.

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ovate, 0.45 × 0.25 mm., more or less inflated in basal and carinal portions, keel straight or sligtly arched, free margin curved, slightly involute at the base, apical tooth blunt, three or four cells long, usually tipped with two

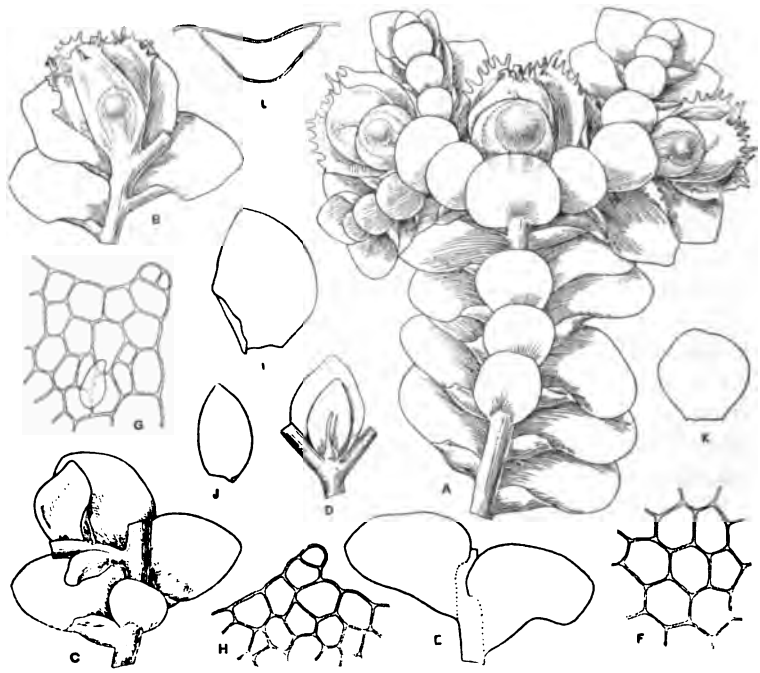

Figure 8.—DICRANOLEJEUNEA ROTUNDATA Evans

A. Part of a floriferous shoot, with a primary inflorescence and two secondary inflorescences, postical view, × 17. B. Secondary inflorescence with one innovation, the underleaves dissected away, postical view, × 17. C. Part of a shoot showing the base of a branch of the *Frullania* type, postical view, × 17. D. Unfertilized secondary inflorescence, the bracteole dissected away, postical view, × 17. E. Two leaves, antical view, × 17. F. Cells from the middle of a lobe, × 225. G. Apical tooth of a lobule, × 225. H. Proximal tooth of a lobule, × 225. I, J. Bracts from a primary inflorescence, × 17. K. Bracteole from another primary inflorescence, × 17. L. Transverse section of a perianth in the upper third, × 17. The figures were drawn from the type specimen.

superimposed cells or with two cells side by side, proximal tooth shorter but usually tipped with two superimposed cells; lobule often poorly developed, with indistinct teeth or even entire on the free margin; cells of lobe plane or nearly so, averaging 15 μ at the margin, 35 × 27 μ in the middle, and 40 × 30 μ at the base, thin walled, trigones small, triangular, intermediate

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thickenings narrowly oval, infrequent except near the base: underleaves contiguous to loosely imbricated, plane, broadly orbicular, about 0.45 mm. long and 0.55 mm. wide, cuneate at the base, broad and rounded or truncate at the apex, entire throughout or slightly crenulate near the base: inflorescence apparently dioicous (male inflorescence unknown): ♀ inflorescence borne on the stem or a leading branch, innovating on both sides, the innovations soon floriferous, the secondary inflorescences innovating on one or both sides with sterile innovations; bracts unequal in size, those of the primary inflorescence suberect, the lobe of the larger one ovate, 1.2 × 0.9 mm., gradually narrowed to a blunt point, entire, the lobe of the smaller one more narrowly ovate, 0.8 × 0.45 mm., subacute, entire, lobule a small basal fold, maximum size about 0.45 × 0.07 mm. but in extreme cases reduced to a hyaline papilla; bracteole similar to the underleaves but relatively narrower, about 0.75 × 0.8 mm., bracts and bracteoles of secondary flowers smaller but otherwise similar to those of the primary flower; perianth slightly exserted, obovate in outline from a cuneate base, 1.1 mm. long and 0.9 mm. wide (in secondary inflorescences only 0.9 × 0.8 mm.), truncate at the apex with a short beak, antical surface concave, mostly smooth, rarely with a spine or two in the apical region, postical surface with a broad rounded keel bearing a few scattered spines in the apical portion, lateral keels bearing broad wings extending from the apex sometimes to beyond the middle, sharply and irregularly spinose, the spines usually six to ten on each wing, mostly three to six cells long and two cells wide at the base but very variable: capsule (immature) about 0.35 mm. in diameter. (Fig. 8.)

The present plant is one of those species in which a prostrate habit is retained through life and is remarkable for its entire, broad, and usually rounded leaves. Its closest ally is perhaps *D. phyllorhiza* (Nees) Schiffn., a species of the American tropics known to the writer from descriptions only.[1] This species, which shows the same habit of growth as *D. rotundata*, is considerably more robust, the leaf-lobes being 2.25 mm. long and 2 mm. wide, according to Stephani's description. It is further distinguished by its relatively broader leaves, by its autoicous inflorescence, by the obovate-oblong lobes of its perichaetial bracts, and by its spatulate bracteoles.

XI. **Brachiolejeunea** (Spruce) Schiffn.

24. **Brachiolejeunea densifolia** (Raddi) Evans

Brachiolejeunea bicolor (Nees) Schiffn.; Engler & Prantl, Nat. Pflanzenfam. **1**[3]: 128. 1895.

Brachiolejeunea densifolia Evans, Bull. Torrey Club **35**: 158. 1908.[2]

[1] See Stephani, Sp. Hep. **5**: 162. 1912.

[2] A full synonymy of the species may be found here.

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On wood, San Miguel, 6,000 feet, July 24, 1911. On rocks, Santa Ana, 3,000 feet, August 4, 1911.

A widely distributed species in tropical America, its known range extending from Mexico to Brazil and Bolivia. It flourishes best at high elevations. The writer has already pointed out the fact that the West Indian records for the species are based on incorrect determinations.[1]

XII. **Marchesinia** S. F. Gray

25. **Marchesinia brachiata** (Swartz) Schiffn.

Marchesinia brachiata Schiffn.; Engler & Prantl, Nat. Pflanzenfam. **1**[3]: 129. 1895.

On earth, San Miguel, 6,000 feet, July 24, 1911.

This species has recently been fully discussed by the writer and its extensive range commented upon.[2] It is known at present from Mexico and the West Indies; from Venezuela, Colombia, and Brazil; from Ecuador, Peru, and Bolivia; and from the Galapagos Islands.

XIII. **Omphalanthus** Lindenb. & Nees

26. **Omphalanthus filiformis** (Swartz) Nees.

Omphalanthus filiformis Nees; G. L. & N. Syn. Hep. 304. 1845.

On rocks, Huadquiña, 5,000 feet, August 1, 1911. On wood, Santa Ana, 3,000 feet, August 4, 1911.

As in the case of the preceding species *Omphalanthus filiformis* has recently been described at length by the writer.[3] It has an equally wide distribution, being known from several of the West Indian Islands, and, on the mainland, from Mexico to Bolivia. It has been collected also on the Galapagos Islands.

XIV. **Frullania** Raddi

Over seven hundred species of *Frullania* are recognized by Stephani,[4] the vast majority being tropical. Many of them are of considerable size and show a striking reddish or purplish pigmentation, so that they readily attract the attention of collectors. In certain respects the genus shows a high degree of specialization, although it

[1] Bryologist **15**: 62. 1912.

[2] Bull. Torrey Club **34**: 546. *pl. 32.* 1907.

[3] Bull. Torrey Club **34**: 18. *pl. 3, f. 1–9.* 1907.

[4] Sp. Hep. **4**: 316—686. 1910—1911.

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retains a primitive type of branching. In the present collection five species are in a condition to be determined, a sixth species being sterile and doubtful. Of the five species the first three noted below belong to the subgenus *Chonanthelia* of Spruce, the fourth to the subgenus *Trachycolea*, and the fifth to the subgenus *Thyopsiella*. The three species of *Chonanthelia* are among the most widely distributed *Frullaniae* of the American tropics but have never been illustrated. Since they are of interest from various points of view the writer takes the present occasion for discussing them at length. The species of *Trachycolea* has already been figured and described by the writer in another connection,[1] while the species of *Thyopsiella* is still in need of further study.

27. **Frullania gibbosa** Nees

Frullania gibbosa Nees; G. L. & N. Syn. Hep. 411. 1845.

On rocks, Santa Ana, 3,000 feet, August 4, 1911.

The author of *F. gibbosa* based his species on a series of specimens from the West Indies, Guiana, and Brazil. In the later pages of the Synopsis Hepaticarum it is recorded also from Mexico and Colombia. Spruce extended its known range into Peru and commented on the curious fact that it behaved as a weed and always grew in the neighbourhood of human habitations.[2] Stephani notes its occurrence in Alabama and in Chile and states also that it is very common in tropical America, without giving definite localities. The material from Santa Ana belongs to Spruce's variety *densissima*, which he suggests may be specifically distinct. In the opinion of the writer, however, the differential characters assigned to this variety represent exaggerations of the features characteristic of the species and are neither marked enough nor constant enough to warrant a specific separation.

The first specimen of *F. gibbosa* quoted by Nees von Esenbeck was collected by Swartz on tree-trunks in Jamaica and may be regarded as the type of the species. It represents a part of the material upon which Swartz based his *Jungermannia obscura*,[3] a composite species which is no longer recognized. A portion of this type material, preserved in the Lindenberg herbarium at Vienna (*No. 6979*), has been examined by the writer; it is unfortunately very fragmentary but seems referable to *F. gibbosa* as at present understood. The same herbarium contains specimens from Colipa, Mexico (*Liebmann*,

[1] Trans. Conn. Acad. **10**: 14. *pl. 6.* 1897.

[2] Hep. Amaz. et And. 22. 1884.

[3] Fl. Ind. Occid. **3**: 1869. 1806.

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No. 6947) British Guiana (*Campbell, No. 6948*), French Guiana (*Leprieur, No. 6977*), Barbados (Herb. Hooker, *No. 6952*), and Merida, Colombia (*Moritz, Nos. 6949, 6950*). These specimens are among those mentioned in the Synopsis Hepaticarum, and all clearly represent the same species. C. Wright's specimens of *F. gibbosa* from Cuba, distributed in Hepaticae Cubenses; a large series from Jamaica, collected by Harris, Underwood, Maxon, and the writer; and Spruce's specimens from Tarapoto, Peru, distributed in Hepaticae Spruceanae, have likewise been examined. All of this material is clearly *F. gibbosa*, but the specimens from the Bahama Islands, recently reported upon by the writer,[1] differ somewhat from the others and perhaps belong elsewhere.

With regard to the habitat of the species it occurs both on bark and on rocks, frequently in exposed situations, and some of its peculiarities seem to be associated with a xerophytic environment. The plants cling closely to the substratum and the stems branch frequently. Sometimes the branches are variable in length and become irregularly subdivided; sometimes they are more or less definitely limited in growth and give the shoots a plumose appearance. Under the latter circumstances the branches tend to be simple or else develop only one or two short branches of a higher rank. In color the plants vary from a greenish yellow to a deep dull brown and are often tinged with whitish, owing to the fact that the margins of the leaf-lobes die and bleach out through exposure.

The leaves are very closely imbricated, especially in the variety *densissima*, the imbrication affecting not only the lobes but the lobules as well (Fig. 9, A). The lobes are convex when dry but are more or less squarrose; when moist the apical portion spreads still more widely from the axis, making the surface of the lobe somewhat concave, but this appearance is never so pronounced as in *F. squarrosa* (R. Bl. & N.) Dumort., a species which resembles *F. gibbosa* at first sight and which grows in similar localities. The lobes in the present species are broadly orbicular, measuring about 0.9 mm. in length and 1.2 mm. in width; they arch considerably beyond the axis and are rounded at the apex. At the base a distinct auricle is developed and this may be plane or more or less crispate (Fig. 9, D). This auricle is usually so large and so strongly dilated that it covers over the line of attachment of the lobe. The margin of the auricle is crenulate from projecting cells, although the rest of the lobe is quite entire.

[1] Bull. Torrey Club 38: 220. 1911.

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The lobules (Fig. 9, A–C) measure 0.6–0.7 mm. in length and 0.45–0.6 mm. in width when well developed. In normal cases the upper part develops an inflated water-sac, well rounded above and with an oblique mouth. In some cases the inflated portion occupies the entire sac and the mouth is wide open; in other cases the inflated

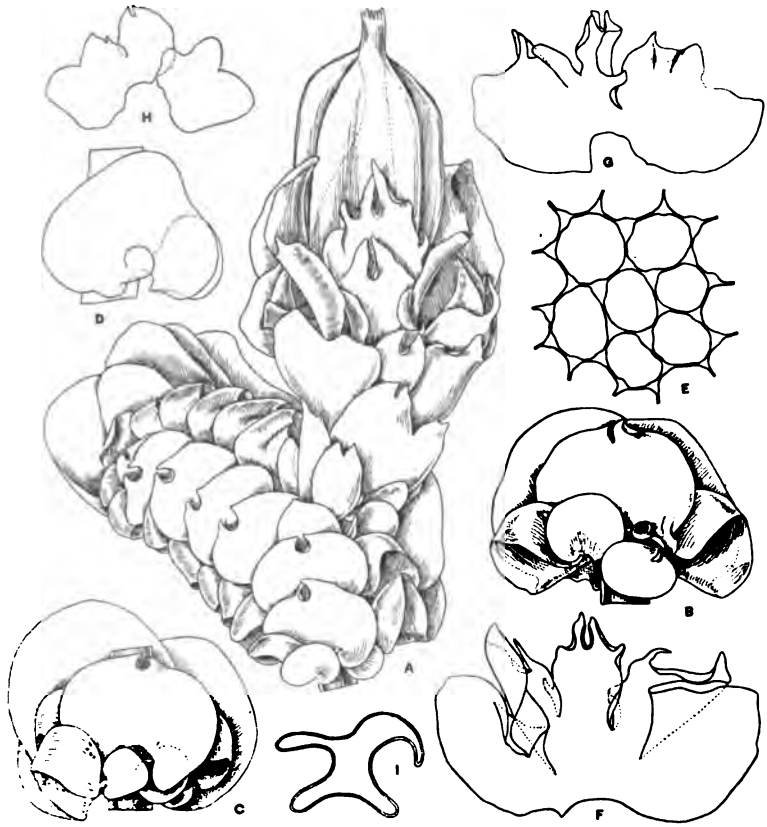

Figure 9.—FRULLANIA GIBBOSA Nees

A. Part of a branch bearing a paroicous inflorescence with perianth, postical view, × 27. B. Two stem-leaves and an underleaf, the stylus of the leaf on the right forcibly reflexed, postical view, × 27. C. Three stem-leaves and an underleaf, postical view, × 17. D. Stem-leaf, antical view, × 17. E. Cells from the middle of a lobe, × 225. F.—H. Bracts and bracteoles of a single inflorescence, F. the innermost series, G. the second, and H. the third (perigonial), × 17. I. Transverse section of a perianth in the upper third, × 27. C. was drawn from a specimen collected by the writer at Content Gap, Jamaica, in September, 1906; the other figures, from the specimens collected at Santa Ana.

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portion is restricted to the upper and outer parts of the sac, the free margin is appressed, and the opening is reduced to a small hole at the outer end. The apex of the lobule, where this hole is situated, never forms a projecting beak as in so many species of *Chonanthelia*. The water-sac, in fact, bears considerable resemblance to those found in *Trachycolea*. The lower part of the lobule, usually occupying in *F. gibbosa* half the length or even less, is the so-called appendiculum of authors. In the present case it is less well developed than in most species of *Chonanthelia* and is variable in form, tending perhaps to be triangular. Along the inner edge the appendiculum is attached to the lobe by a short keel, which spreads more or less widely away from the axis or, in rare cases, is subparallel with it. The outer margin of the appendiculum, extending from the end of the keel to the outer end of the water-sac, is sometimes straight and sometimes more or less strongly curved. In most cases it is well covered over by the lobe but occasionally extends slightly beyond it. The margin is apparently never toothed in any way but may be very slightly crispate. In some cases the lobule does not form a water-sac but consists of an ovate lamina, which is either plane or slightly canaliculate and which tapers to a blunt point.

The stylus is remarkably developed and sometimes approaches the lobule itself in size. It varies from an ovate to a broadly reniform expansion and is sometimes plane but much more frequently crispate. Sometimes the stylus is appressed to the axis and is directed toward the apex of the shoot (Fig. 9, C, on left); sometimes it is completely reflexed by the auricles of the underleaves (Fig. 9, C, on right); and sometimes a portion only is reflexed, while the rest occupies the normal position. Under the last conditions the stylus is sometimes bifid. Apparently the broad expansion just described represents an extreme development of the inner basal portion of the stylus. The reason for this idea is that, between the expansion and the lobule, a slender tooth-like structure, tipped with a hyaline papilla, can be discerned (Fig. 9, B, on right). In most species of *Frullania* the entire stylus consists of a structure of this character.

Although the stylus in *F. gibbosa* is so conspicuous and affords one of the most distinctive features of the species, it is not mentioned by Nees von Esenbeck, and its characteristics are not brought out by Stephani. Gottsche,[1] however, emphasizes its importance, and Spruce describes it at some length. According to his account it attains its highest development in the variety *densissima*, where

[1] Ann. des Sc. Nat. Bot. V. **1**: 166. 1864.

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it is often more or less adnate to the auricles of the underleaves. The writer has been unable to demonstrate this adnation, even on robust plants, although it might perhaps be hazardous to maintain that it never occurred. In any case, however, the adnation is too inconstant to be considered a differential character of importance.

The underleaves are about as large as the lobes and agree with them in being densely crowded. They are broadly orbicular or reniform and are attached by a slightly arched line. The two sharp apical teeth are separated by a lunulate sinus and are usually less than one fourth the length of the underleaf. The teeth are commonly connivent and tend to be more or less twisted or contorted, while the margin of the sinus is often revolute. Somewhere between the bottom of the sinus and the line of attachment the underleaves form a short and rounded tubular projection, at the tip of which the rhizoids are developed. At the base the underleaves are strongly auriculate on each side. The auricles are much like those on the lobes. They are often more or less crispate and may be so dilated that they partially cover over the line of attachment of the underleaves. Sometimes the crispate nature of the auricles is so exaggerated that incomplete water-sacs are formed. It will at once be noted that the auricles of the underleaves, the auricles of the lobes, and the expanded portions of the stylus are all very similar structures and that through them the capacity of the species for holding water by capillarity is greatly increased. And it is precisely these structures which attain their highest development in markedly xerophytic localities.

The cells of the lobe average about 23 μ along the margin, 33 μ in the middle, and 43 μ at the base. The trigones are large and well developed, showing a triangular form with straight or bulging sides (Fig. 9, E). They are rarely confluent, and intermediate thickenings are almost never present. On the lobules and underleaves the cells are smaller, but the trigones are relatively larger, more irregular in form, and more frequently confluent.

Nees von Esenbeck does not describe the type of inflorescence found in *F. gibbosa* and makes no mention of the male spikes, and the later descriptions would indicate that the inflorescence is subject to variation. According to Gottsche it is dioicous, according to Spruce it is normally autoicous but is paroicous in the variety *densissima*, according to Stephani it is monoicous, that is, autoicous. When the writer examined the Mexican specimens in the Lindenberg herbarium the conclusion was reached that they were dioicous and that the statement of Gottsche was correct. Since, however,

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no dissections were made, it is possible that the female branches may have borne undetected perigonial bracts at the base. All the other specimens which have been examined with special reference to the inflorescence have proved themselves either autoicous or paroicous. It is probable therefore that the inflorescence ought to be described as heteroicous, in which case the male individuals described by Gottsche may have been due to an unfavorable environment. Apparently a paroicous inflorescence is associated with marked xerophytism.

The female branch (Fig. 9, A) is very short and seems to be invariably simple. Sometimes it arises directly from a principal axis, sometimes from a primary branch. The perichaetical bracts and bracteoles have been well described by Spruce. They are exceedingly variable but always show a high degree of coalescence (Fig. 9, F–H). The bracts, however, are completely free at the antical base. When well developed the lobes of the innermost bracts are about 1.5 mm. long and 0.9 mm. wide; they show an ovate form, a rounded to obtuse apex, and an entire or sinuate margin. The lobules are about as long and almost as wide but they taper more toward the apex, which varies from obtuse to acute. The lobules are usually so strongly convolute that they appear narrower than they really are. The stylus is commonly represented by a slender tooth-like process on the inner edge of the lobule but it may be in the form of a rounded lobe near the base. The innermost bracteole is about 1.5 mm. long and 0.6 mm. wide and is bifid one tenth to one fifth its length. The divisions are erect and more or less sharp-pointed, and the sinus is narrow and usually acute. The lateral margins of the bracteole are sometimes entire and sometimes bear one or two teeth, lobes, or laciniae on each side. The divisions of the bracteole are often further distinguished by being canaliculate or irregularly revolute in various portions of the margin. The remaining bracts and bracteoles show a greater approach to ordinary leaves and underleaves. In the case of a paroicous inflorescence the perigonial bracts (Fig. 9, H) are much like the perichaetial bracts except that the parts are smaller, the lobes are saccate at the base, and the coalescence is much less extensive. In the case of a purely male inflorescence the bracts are much the same as in other species of *Chonanthelia*.

The perianth is of the normal type and shows two sharp lateral keels, two sharp postical keels, and a grooved antical face (Fig. 9, A, I). It measures about 2 mm. in length and 0.9 mm. in width and tapers gradually to the apex, which is tipped with a long and slender

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beak. The cells have bulging trigones and the intermediate thickenings, although still rare, are much more numerous than elsewhere. Coalescence between thickenings is frequent. The beak is fringed by a series of unicellular papillae at the mouth and a number of similar papillae grow out from the inner surface, so that the mouth is completely blocked up by them. Gottsche was apparently the first to call attention to this striking peculiarity. He stated that it occurred not only in *F. gibbosa* but in *F. riojaneirensis* (Raddi) Spruce and other allied species. It is not, however, confined to the subgenus *Chonanthelia*. It is found likewise in *F. saxicola* Aust. and *F. cleistostoma* Schiffn. & Wollny, two species belonging to the subgenus *Trachycolea*.[1]

In distinguishing *F. gibbosa* from related species the following characters will be found most serviceable; the brownish pigmentation, the closely imbricated leaves and underleaves, the well-developed auricles at the bases of the lobes and underleaves, the blunt apex of the lobule not extending into a horn, the small appendiculum, the broadly expanded stylus, the absence or great infrequency of intermediate thickenings in the leaf-cells, the blunt and entire lobes of the bracts, the four-keeled perianth with the beak closed by papillae.

28. **Frullania hians** (Lehm. & Lindenb.) Mont. & Nees

Jungermannia hians Lehm. & Lindenb.; Lehmann, Pug. Plant. **4**: 55. 1832.

Frullania hians Mont. & Nees, Fl. Boliv.; d'Orbigny, Voy. dans l'Amér. Mérid. **7**[2]: 69. 1839.

On bark, San Miguel, 6,000 feet, July 24, 1911. On rocks, Santa Ana, 3,000 feet, August 4, 1911.

The original material of the present species was collected by Schiede and Dieppe at Xalapa, Mexico. According to our present knowledge its range extends from the West Indies and Mexico, through Costa Rica, Colombia, Ecuador, and Brazil, to Bolivia and Argentina. It has also been reported by Stephani from the Galapagos Islands. It seems to be confined to rather high altitudes. A portion of the type specimen, preserved in the Lindenberg herbarium at Vienna, has been examined by the writer and agrees in all essential respects with the specimens from Ecuador distributed by Spruce. Specimens from Jamaica, Colombia, and Brazil have also been studied. As in the case of *F. gibbosa* the

[1] See Schiffn. Oester. Bot. Zeitschr. **59**: 469. *f.* 22. 1909. Also Evans, Rhodora **12**: 203. 1910.

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present plant formed a part of Swartz's aggregate species *Jungermannia obscura*. It is a species of wide variability and has been carefully described by Spruce. His description, however, differs in certain respects from the later description of Stephani.

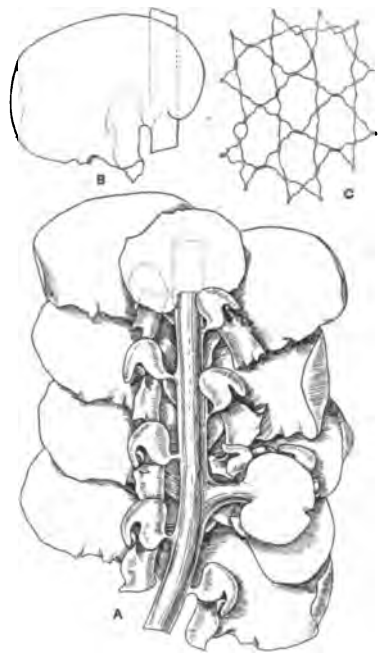

Figure 10.—FRULLANIA HIANS (Lehm. & Lindenb.) Mont. & Nees

A. Part of a robust stem, postical view, × 17. B. Leaf, antical view, × 17. C. Cells from the middle of a lobe, × 225. The figures were drawn from specimens collected by Spruce in the Andes of Ecuador and distributed in his exsiccatae.

The plants are of large size and grow in rather loose mats, sometimes on rocks or banks, sometimes on trees. They show a wide range of color, varying from a pale yellowish green to a deep purplish black. The stems are at first prostrate, without clinging very closely to the substratum; later on they separate still more and assume a spreading or ascending position. On robust sterile shoots the branches are usually short and simple, so that the shoot is distinctly pinnate. On fertile shoots there is a strong tendency for the later branches to elongate and become subdivided, thus giving the shoot a flabellate appearance, and the growth of such a shoot is usually limited by the development of the sexual branches.

The leaves are imbricated and the lobes are strongly convex and widely spreading but not squarrose (Fig. 10, A). They are ovate in outline, measuring about 1.6 mm. in length and 1.2 mm. in width; the apex is rounded, and the whole apical region is usually distinctly revolute. The antical portion arches across the axis and is cordate or auriculate at the base (Fig. 10, B), although the auricles never reach the high degreee of development found in *F. gibbosa*. The postical margin, between the revolute apical portion and the junction with the lobule, is more or less strongly crispate.

The lobule measures about 0.75 mm. in length and 0.35 mm.

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in width; it consists, as in other species of *Chonanthelia*, of a water-sac and an appendiculum, each occupying about half its length. Sometimes the lobules do not overlap at all, but frequently the water-sac of one lobule partially covers over the appendiculum of the next younger lobule on the same side. The water-sac is well rounded above, and the inflated portion is restricted to the upper and outer portions. The apex of the lobule extends as a slender, subacute to rounded process directed backwards. The free margin is more or less curved in the inner part and lies closely appressed to the appendiculum. The outer part forms a distinct angle with the inner part and is involute except near the apex, thus forming a narrow, canal-like opening leading into the water-sac. The appendiculum is variable with respect to its outline and the character of its margin. When well developed it consists of a plane or more or less crispate expansion, oblong-rectangular in form, extending beyond the margin of the lobe, and connected with the latter by a long straight keel, which is parallel with the axis and about 0.15 mm. distant from it. The outer angle of the appendiculum is sometimes rounded but more frequently forms a sharp tooth-like point, and additional teeth are developed. The margin at the upper end, near where it joins the apical portion of the lobule, is involute and often appressed to the outer surface of the sac, thus making a more complete closure of the mouth. Although the conditions just described represent the more typical features of the appendiculum, it is not unusual, especially on branch-leaves, for it to be more triangular in form, the base of the triangle being at the junction with the water-sac, the apex at the lower end of the keel. The stylus is extremely minute and consists of a row of cells tipped with a hyaline papilla.

The underleaves, which measure about 0.75 × 0.9 mm., are broadly orbicular and more or less imbricated. Except for the apical indentation, the margin is entire or sinuate, although more or less crispate. The line of attachment is slightly arched, and the base is strongly cordate or auriculate, the auricles being sometimes so large that they overlap. The apical teeth are from one tenth to one fifth as long as the underleaf; they are more or less sharp-pointed and vary from suberect to connivent, while the sinus is rounded. The basal portion of the underleaf develops a bulging radicelliferous region, which remains rudimentary if no rhizoids are formed.

The cells of the lobe average about 20 μ along the margin, 26 μ in the middle, and 40 × 26 μ at the base. The trigones are large

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and triangular with bulging sides, one side being usually shorter than the other two; sometimes one or two of the sides are concave or wavy, making the trigones irregular (Fig. 10, C). In the middle of the lobe intermediate thickenings are infrequent; toward the margin, however, as well as on the lobules and underleaves, they are much more abundant. They are mostly oval with bulging sides but are sometimes more irregular. Except in the middle portion of the lobe coalescence between thickenings often occurs.

The inflorescence is autoicous. The archegonia are borne on an elongated branch, which is more or less subdivided, one of the branches arising among or just behind the bracts. According to Spruce the latter are in seven pairs, according to Stephani in three. The writer has found the number of pairs to vary from two to five. The bracts increase rapidly in size toward the perianth, those of the innermost pair having lobes about 3.5 mm. long and 1.5 mm. wide. The innermost bracts are free from each other at the antical base but are highly connate with the bracteole and form with it a widely spreading open cup, in the bottom of which the perianth is situated. The lobes of these bracts are plane, ovate in outline, and acuminate at the apex. In most cases they are sharply and coarsely dentate or spinose above the middle, but in some cases they are nearly or quite entire. When teeth or spines are present the maximum number is perhaps seven on the outer margin and five on the inner. The lobule is about as long as the lobe but narrower, and it appears narrower than it really is on account of its revolute margins. The apex forms a long and slender point, and there is usually if not always a slender tooth, representing the stylus, close to the junction with the bracteole. Aside from the stylus the margin of the lobule may be either entire or else irregularly toothed or spinose. The bracteole is about 2.7 mm. long and 1 mm. wide; it is deeply bifid, the broad and rounded sinus extending nearly or quite as far back as the clefts between the bracteoles and the lobules of the bracts. The divisions of the bracteole are much like the lobules, being long-pointed and with revolute margins, while the latter are either entire or variously toothed. The remaining bracts and bracteoles show a gradual transition toward normal leaves and underleaves.

The perianth, which is terete or slightly compressed, is narrowly oblong or ovate in outline; it measures 3—4 mm. in length and about 0.9 mm. in width and extends slightly or not at all beyond the involucre. At the apex it is rounded or truncate and bears a long slender beak, the throat of which is closed by short internal papillae, rarely reaching the minutely crenulate mouth. Except in the basal

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region the perianth is deeply plicate. The keels, which number about ten, are rounded and separated by rounded grooves; on the surface they are usually smooth but may be slightly roughened.

The antheridial spikes occupy short branches or are terminal on them and apparently never proliferate. The bracts are imbricated and are mostly in from two to four pairs. The lobes are ovate and obtusely pointed or apiculate, measuring about 0.65 × 0.45 mm.; the lobules are shorter and narrower, measuring about 0.5 × 0.25 mm., they are often more or less revolute along the free margin and are attached to the lobe by a strongly arched keel. The apex of the lobule is much like that of the lobe. The bracteoles are ovate and measure about 0.3 × 0.25 mm., the base is slightly or not at all cordate, the margin is entire, and the apex is shortly biapiculate.

Spruce recognizes eight species of *Chonanthelia* with pluriplicate perianths from South America and Stephani thirteen. According to Spruce the subgenus falls naturally into two groups: *Cladocarpicae*, with the single species *F. brachyclada* Spruce, of Ecuador; and *Acrocarpicae*, with the remaining species. *F. brachyclada* and seven of the *Acrocarpicae* have pluriplicate perianths. The distinction between the two groups is that in the *Cladocarpicae* the female branch is very short and bears bracts only, while in the *Acrocarpicae* it is variable in length and bears leaves as well as bracts. Unfortunately this distinction is not very constant, the female branch in *F. brachyclada* being sometimes more or less elongated and bearing normal leaves.

Of the eight species recognized by Spruce, the only ones decribed as autoicous are *F. hians* and *F. Arecae* (Spreng.) Spruce, and it should be noted that Stephani describes this latter species as dioicous. In his Hepaticae Spruceanae, Spruce distributed specimens of *F. Arecae* from Ecuador, and these specimens, in the set examined by the writer, show female inflorescences without perianths but no signs of antheridial spikes. They would therefore support Stephani's idea of a dioicous inflorescence. Unfortunately they do not agree in all respects with Spruce's description, so that it is possible they do not represent his idea of the species.

The plants in the Ecuador material are a little larger than in *F. hians*, the lobes measuring about 1.8 × 1.5 mm., the lobules about 1.5 × 0.8 mm., and the underleaves about 1.6 × 1.6 mm. The lobes, lobules and underleaves lack the crispate regions, which are usually so marked in *F. hians*, and the appendiculum of the lobule is rounded and quite entire. The underleaves are orbicular

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and distinctly auriculate at the base, the auricles often overlapping. The innermost bracts and bracteoles of the female inflorescences are not well developed; the lobes of the bracts, however, are entire and the same thing is true of the lobules (except for the stylus) and of the divisions of the underleaves. None of these parts are canaliculate. The specimens are clearly distinct from *F. hians*, but it is evident that *F. Arecae* is in need of further study. It is perhaps worth noting that there is a specimen of *Jungermannia Arecae* Spreng. in the Lindenberg herbarium at Vienna, labeled "*ab ipso*," and presumably a co-type. This specimen is autoicous but lacks perianths and is insufficient to give a clear idea of the species. According to Stephani the range of *F. Arecae* extends from Mexico to Chile and the plant is common throughout this whole region.

Among the species with pluriplicate perianths recognized by Stephani the following are autoicous: *F. glauca* Steph., of Brazil; *F. itatiaja* Steph., of Brazil; and *F. spiniloba* Steph., of Panama and Ecuador. These species are known to the writer from description only and are evidently very close to *F. hians*.

In distinguishing *F. hians* the following characters will be found useful: the reddish or purplish pigmentation (not always present), the imbricated leaves and underleaves, the more or less crispate lobes, lobules and underleaves, the strongly arched water-sac terminating in a slender point, the variable, oblong appendiculum often with teeth, the minute stylus, the great infrequency of intermediate thickenings in the middle of the lobe and their greater frequency elsewhere, the autoicous inflorescence, the crowded, large and highly coalescent bracts and bracteoles, the sharp-pointed and often toothed lobes, lobules and divisions of the bracteoles, the canaliculate lobules and divisions, the long pluriplicate perianth with a long beak, the throat of which is closed by papillae.

29. **Frullania laxiflora** Spruce

Frullania laxiflora Spruce, Hep. Amaz. et And. 26. 1884.

On wood, San Miguel, 6,000 feet, July 24, 1911.

In his original description of *F. laxiflora* Spruce records the typical form of the species from trees and rocks in Ecuador and a variety *Crossii* from Colombia. Stephani states that the plant grows also in Guatemala and Venezuela. The writer has seen no authentic specimens of the species and bases his determination of the Peruvian material on the full descriptions of Spruce and Stephani.

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The plants are loosely tufted and more or less tinged with reddish brown. The stems cling very loosely to the substratum or assume an ascending position, rhizoids being scantily developed. In most

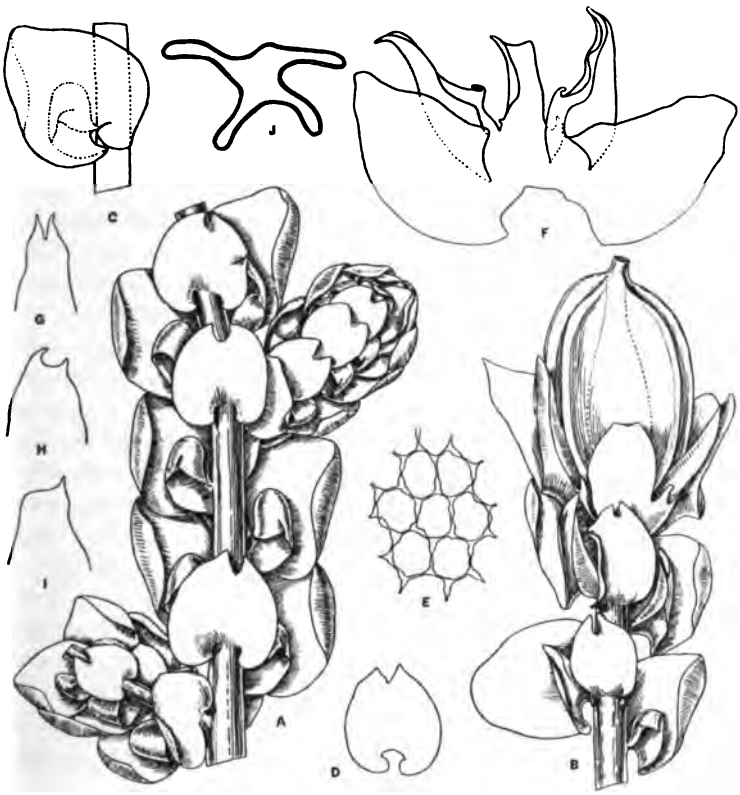

Figure 11.—FRULLANIA LAXIFLORA Spruce

A. Part of a robust stem, postical view, × 17. B. End of a female branch with perianth, postical view, × 17. C. Leaf, antical view, × 17. D. Underleaf, the basal auricles flattened out, × 17. E. Cells from the middle of a lobe, × 225. F. Innermost bracts and bracteole, × 27. G.—I. Apices of the innermost bracteoles from three inflorescences, × 27. J. Transverse section of a perianth at about the middle, × 27. The figures were drawn from the specimens collected at San Miguel.

cases they are simply pinnate, the branches being distant and quickly limited in their growth; occasionally a branch, especially if bearing archegonia, gives rise to one or two short branches of a higher order.

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The leaves are distant to loosely imbricated, and the convex lobes spread widely from the axis but appear to spread obliquely on account of the revolute apical portions (Fig. 11, A). The lobes are ovate and measure about 1.3 mm. in length and 1.1 mm. in width. At the antical base a large and dilated auricle is developed, which often covers over more or less completely the line of attachment (Fig. 11, C). The margin is entire and the apex is broad and rounded in the Peruvian material, although Spruce says that it is usually obtuse.

The lobule, which measures about 0.7 × 0.35 mm., shows the usual division into water-sac and appendiculum, these being about equal in length. The water-sac is rounded above and inflated in the upper and outer portions. The free margin spreads almost at right angles from the axis and is more or less outwardly curved: the outer part of the margin forms a distinct angle with the rest and meets the outer edge of the appendiculum at an obtuse angle, forming however a very acute angle with the outer boundary of the sac. In other words the apex of the lobule is not prolonged as a free process. Most of the free margin is appressed but the outer part is free and helps form the narrow cylindrical passage into the sac. The appendiculum is ovate-triangular, the base being at the sac, one side forming the outer edge, and the other being at the keel between the lobule and the lobe. This keel, on robust leaves at least, is curved inward, the end usually extending to the antical surface of the axis and sometimes meeting the auricle at the base of the lobe; on branch-leaves the keel is often straight or nearly so. The stylus is minute and usually consists of a short row of cells tipped with a hyaline papilla.

The underleaves are large but rarely overlap except toward the apex of a stem or branch. They are plane or somewhat revolute along the sides and are orbicular in outline, measuring about 0.75 mm. in length. They are further distinguished by being bifid about one eighth their length, the divisions being sharp and the sinus rounded. In most cases the divisions are triangular and erect but they may be connivent. The margin is entire or nearly so, and the base is auriculate on each side (Fig. 11, D), the auricles being usually involute along their inner edges in such a way that the underleaf seems to end in two pointed processes (Fig. 11, A). The modified underleaf at the base of a branch is broad and bears a shallow apical sinus separating two blunt and divergent divisions (Fig. 11, A, at base).

The leaf-cells average about 16 μ along the margin of the lobe,

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25 × 20 μ in the middle, and 35 × 27 μ at the base. Trigones are well developed, intermediate thickenings are frequent even in the median region, and coalescence often takes place (Fig. 11, E). The trigones are triangular in form but are subject to considerable variation. Sometimes all three of the sides are convex, but it is much more usual for only one to be convex, the other two being either concave or wavy. When two wavy sides meet the angle between them is often rounded. Sometimes the sides of the trigone are all wavy, and then two or even all three angles of the triangle may be rounded. The intermediate thickenings are for the most part oval.

The inflorescence is autoicous. The female branch is more or less elongated, and the bracts, which are mostly in two or three pairs, are not crowded as in so many species of *Chonanthelia* but scarcely overlap at all (Fig. 11, B). The innermost bracts are shortly coalescent with the corresponding bracteole and spread very slightly away from the perianth (Fig. 11, F). The lobe is ovate and averages about 1.3 × 0.7 mm., the margin being entire or vaguely sinuate. The apex varies from rounded to acute or even acuminate. The lobule, which measures about 1.2 × 0.6 mm., is also ovate, and acute or acuminate at the apex; it is strongly concave, however, and therefore appears lanceolate. On the inner edge below the middle the stylus, usually in the form of a sharp tooth-like lobe, may be discerned; otherwise the margin of the lobule is quite entire. The innermost bracteole is narrowly to broadly ovate and measures about 1 mm. in length and from 0.3—0.5 mm. in width. The apex is very variable (Fig. 11, B, G—I). Although normally bifid for about one sixth its length with acute divisions and sinus, the latter may be much shallower and rounded, and the divisions may be obtuse or blunt. It is not unusual, indeed, for one division to be larger or otherwise different from the other, thus making the bracteole unsymmetrical. Aside from the apical divisions the bracteole is either entire or bears a lobe-like tooth on one or both sides near the base. Between the innermost bracts and bracteole and ordinary leaves and underleaves the usual gradation may be observed.

The perianth (Fig. 11, B) projects for half its length or less beyond the bracts. It measures about 1.5 mm. in length and 1 mm. in width and is obovate in outline, tapering toward the base and rounded or truncate at the apex. The beak is well developed and practically entire at the mouth, but the throat is closed by short papillae growing out from the inner surface. The perianth is four-

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plicate for the greater part of its length, both lateral and postical keels being sharp (Fig. 11, J). The antical surface is either plane or else bears a low and short keel in the upper part.

The antheridial spikes occupy entire branches and are infrequently produced. They are unusually small, being completely covered over by the leaves, and commonly arise on a female branch. Each spike bears two or three pairs of closely imbricated, strongly inflated, subequally bifid bracts, the divisions being acute or apiculate and entire, except for the very minute stylus on the inner margin of the lobule. The bracteoles are small and shortly bifid.

In *Frullania tetraptera* Nees & Mont.[1] and *F. semiconnata* Lindenb. & Gottsche,[2] the present species has two very close allies. *F. tetraptera* was based on specimens collected by d'Orbigny at Valparaiso, Chile, and has since been recorded from Rusby's Bolivian collections by Spruce. *F. semiconnata* was based on material gathered by Liebmann at Chinantla, Mexico. It has since been reported by Gottsche from the vicinity of Bogota, Colombia, by Spruce from near Quito, Ecuador, and by Jack and Stephani from Argentina. In his latest treatment of the genus *Frullania*, however, Stephani reduces *F. semiconnata* to a synonym of *F. tetraptera* and states that the species is common in tropical America and in Chile. Strange to say, on a later page of the same work, he quotes *F. tetraptera* as a synonym of *F. gibbosa*, so that his views on the subject are not altogether clear. Spruce calls attention to the fact that *F. semiconnata* is essentially a weed in the regions where he observed it, growing particularly on the bark of apple trees.

Of *F. semiconnata* the writer has examined a portion of the type specimen in the Lindenberg herbarium at Vienna and also the abundant material collected by Pringle at Cima, Federal District, Mexico, and distributed in his Plantae Mexicanae (*No. 10,680*). No material of *F. tetraptera* has been available for study. The Mexican specimens of *F. semiconnata* were determined by Stephani and show both male and female branches in large number. Unfortunately these seem to be borne on separate individuals, so that the material is dioicous rather than autoicous as the descriptions demand. Since the type specimen is clearly autoicous, there is a possibility of error in the determination of Pringle's plants. His material is evidently very close to *F. laxiflora* but differs in the following particulars: the plants are smaller, the lobes of the leaves

[1] Ann. des Sc. Nat. Bot. II. **9**: 47. 1838.

[2] G. L. & N. Syn. Hep. 776. 1847.

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reaching a maximum size of about 0.85 × 0.75 mm. and the lobules of 0.35 × 3 mm.; the basal auricles of the lobe are less developed; the appendiculum of the lobule is much shorter than the water-sac; the stylus is better developed and is often subulate, being sometimes two or three cells wide at the base; the underleaves are smaller (maximum size about 0.45 × 0.4 mm.), one fifth to one fourth bifid, and cuneate at the base, the sides being often more or less reflexed. In other respects the plants are very much alike.

The following are among the most important characteristics of *F. laxiflora*: the reddish pigmentation (not always marked), the distant to loosely imbricated leaves, the large auricles at the base of the lobes, the blunt water-sac without a distinctly projecting apex, the entire appendiculum rounded along its outer edge, the inwardly curved keel connecting lobe and lobule, the minute stylus, the large and involute auricles of the underleaves, the well-developed thickenings in the walls of the leaf-cells, the autoicous inflorescence, the loosely crowded perichaetial bracts, the variable and entire lobes, the sharp, entire, concave lobules, the variable bracteoles, the four-keeled perianth with its beak closed by papillae.

30. **Frullania squarrosa** (R. Bl. & N.) Dumort.

Frullania squarrosa Dumort. Recueil d'Obs. sur les Jung. 13. 1835.

On rocks, Huadquiña, 5,000 feet, July 30, 1911. On wood, Santa Ana, 3,000 feet, August 3, 1911.

A common and variable species, the range of which apparently extends throughout the warmer regions of the globe.

31. **Frullania brasiliensis** Raddi

Frullania brasiliensis Raddi, Mem. Soc. Ital. Modena, Fis. **19**: 36. 1823; **20**: *pl. 3, f. 2.* 1829.

Jungermannia mucronata Lehm. & Lindenb.; Lehmann, Pug. Plant. **6**: 54. 1834.

Frullania mucronata Nees, Naturg. europ. Leberm. **3**: 239. 1838.

Frullania cylindrica Gottsche; Lehmann, Pug. Plant. **8**: 13. 1844.

Frullania Leiboldii Lindenb. & Gottsche; G. L. & N. Syn. Hep. 782. 1847.

On rocks and wood, San Miguel, 5,000–6,000 feet, July 24, 1911. On rocks, Santa Ana, 3,000 feet, August 3, 1911.

A common and widely distributed species of the American tropics, first described from specimens collected in Brazil but now

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known also from Jamaica, Mexico, Colombia, Venezuela, Peru, and Bolivia. The present material is either completely sterile or else bears scattered antheridial spikes. Fertile plants are readily distinguished by the cylindrical perianths, these organs in most members of the subgenus *Thyopsiella* being distinctly triplicate. In the absence of perianths the apiculate leaf-lobes reflexed at the apex and auriculate at the base, together with the auriculate underleaves with apiculate divisions and revolute margins will aid in the identification of specimens.

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The Appendices to the Gospel according to Mark

A Study in Textual Transmission

BY

CLARENCE RUSSELL WILLIAMS, PH.D.

YALE UNIVERSITY PRESS
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1915

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The modern science of textual criticism is not only a machine to enable the student to construct a text of the New Testament which shall be complete, correct, and free from interpolations. . . . It aims at . . . reconstructing the history of the book studied.

Under the head of "Textual Criticism" comes the history of the book from the time it left the author's hands to the present day, including the study not only of accidental errors introduced by copyists, but also the work of later editors and revisers.

Burkitt, "Two Lectures on the Gospels."

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VI.—THE APPENDICES TO THE GOSPEL ACCORDING TO MARK

By Clarence Russell Williams

INTRODUCTION

Erasmus, in his notes concerning the Greek New Testament, stated that the last twelve verses of the Gospel according to Mark are wanting in the best authorities. This rill of doubt became a river through such editors as Griesbach, Lachmann, Tischendorf, and Tregelles, until in 1871 in mingled grief and indignation, with profound and minute scholarship, Dean John William Burgon defended their authenticity in his learned monograph, "The Last Twelve Verses of the Gospel according to S. Mark vindicated against recent critical objectors and established," which he closes with the characteristic and triumphal saying:

> Enough to have demonstrated, as I claim to have now done, that *not a particle of doubt*, that *not an atom of suspicion*, attaches to "THE LAST TWELVE VERSES OF THE GOSPEL ACCORDING TO S. MARK."
>
> ΤΟ ΤΕΛΟΣ

But when Westcott and Hort's edition of the Greek New Testament appeared in 1881 these verses were separated from the text of Mark and printed in double brackets, while in the accompanying notes Dr. Hort gave a most thorough and careful discussion of the reasons for their rejection (Vol. II, Notes, pp. 28–51).

This was followed, in 1884, by a most elaborate defence of the authenticity of these verses by Abbe J. P. P. Martin, a scholar generally and undeservedly neglected by English and American writers though referred to by Zahn as an authority. In his Introduction à la Critique textuelle du Nouveau Testament, the whole of the second volume (Partie pratique) of 554 pages is devoted to a discussion of this problem, with remarkable thoroughness. In its first hand knowledge of the evidence of the manuscripts this volume is even superior to the learned monograph of Dean Burgon, and we have found no

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volume which equals it in the presentation of reproductions of the manuscripts concerned. Abbe Martin closes his argument in defence of these verses with the suggestion that the question of authenticity be decided in their favor by a decree of the next Ecumenical Council.

Zahn, in his masterly "Geschichte des Neutestamentlichen Kanons" published in 1890 devoted nearly thirty pages to a discussion of the subject (Vol. II, pp. 910–938). The declaration by this leader among the more conservative scholars that "It may be regarded as one of the most certain of critical conclusions, that the words ἐφοβοῦντο γάρ xvi. 8 are the last words in the book which were written by the author himself" expresses the opinion of most scholars today.

Interest in this problem was intensified, and further discussion evoked by the announcement in 1893 of the discovery by F. C. Conybeare of an Armenian codex in which the verses were ascribed to the Presbyter Ariston, and by the announcement in 1908 of the discovery in the Freer Manuscript of the Gospels of the interpolation referred to by Jerome.

English and American scholars frequently refer to H. B. Swete's discussion of the subject (The Gospel according to St. Mark, pp. xcvi–cv, 1898) as the best recent presentation of the textual evidence.

But recent discoveries in manuscripts and the light thrown upon the field by the investigations of textual critics call for a new discussion, not for the purpose of deciding for or against the authenticity of either of the conclusions found at the end of Mark, but as an aid in solving the problems of textual transmission.

Since the discussions of Burgon, Hort, and Martin were published a most important witness for that form of the Gospel which ends with verse eight has been brought to light by the discovery of the Sinaitic Syriac by Mrs. Agnes Smith Lewis in 1892; and the evidence has been increased by the discovery of three manuscripts containing the Shorter Conclusion preceding the Longer, and one cursive (579), apparently overlooked by Swete; and, since the latter's discussion, there has been added the evidence of the Freer Logion, announced in 1908 and of a Sahidic MS published in 1911.

Briefly stated, the results this investigation tends to establish are:

The Longer Conclusion probably originated in Asia Minor during the early half of the second century (the Armenian scholion assigning the authorship to Ariston being cor sidered late, unauthentic, and probably based on some misunderstanding or confusion). It was carried to Rome about 150 A.D. where it had become accepted as the authentic end of the Gospel by the time Tatian compiled his Diatessaron (170 A.D.). It was through Tatian that it gained a place in the

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Syriac New Testament. Supported by the authority and the usage of the great church of Rome, the Longer Conclusion early gained acceptance as an authentic portion of the Gospels throughout the region dominated by it.

The Longer Conclusion is probably an excerpt from an apocryphal Gospel, selected to complete the mutilated Second Gospel.

For the origin of the Shorter Conclusion we must look to Egypt, since the manuscripts which contain it as well as the form of text with which it is associated both point to that country as its source. It was composed as a conclusion to the Gospel, probably by some scholar of Alexandria, before the close of the second century. Its adoption in the territory dominated by the church of Alexandria required a longer time than the adoption of the Longer Conclusion in the territory dominated by Rome, since in Egypt, the home of the purer texts, the tradition of the incomplete form of the Gospel persisted as late as the fourth century, as ℵB witness.

In its transmission from Alexandria the Shorter Ending gained a place in manuscripts of the Sahidic, Bohairic, and Ethiopic versions, and also in the Old Latin Version of Roman North Africa, apparently as early as the time of Cyprian (250 A.D.).

Even after the introduction of the Longer Ending into Egypt the Shorter persisted, struggling with it for centuries, as is proved by the manuscripts containing both endings, until finally the authority of the church at Rome, as well as its own superior intrinsic excellence, established the Longer as the authoritative ending of the Gospel according to Mark.

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PRELIMINARY INVESTIGATION

The evidence to be weighed in judging this question is of so intricate and so disputed a character, as Dr. Hort has well said, that it seems necessary to discuss at greater length than we would have desired the sources and affiliations of the manuscripts, both in the Greek and in the versions, which form the authorities upon which our conclusions are based.

While an endeavor has been made to give a reasonably adequate presentation of the textual evidence, the writer is aware of the importance of other evidence, which, while it has not been discussed, has nevertheless been considered in the reconstruction of the history of the conclusions of the Gospel according to Mark.

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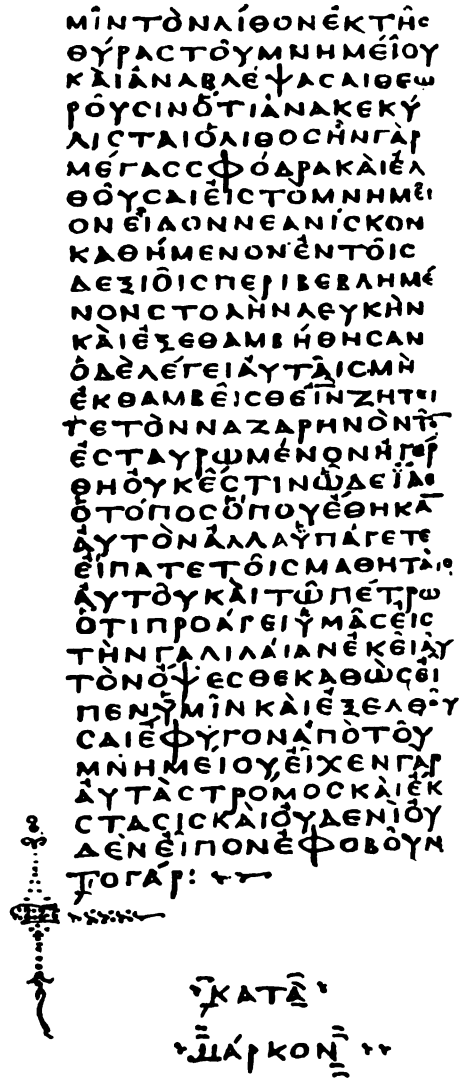
μῖν τὸν λίθον ἐκ τῆσ | θύρασ τοῦ μνη-μείου | καὶ ἀνα βλέψασιθεω|ροῦ-σιν ὅτι ἀνακεκύ|λισται ὁ λιθοσ ἦν γὰρ | μέγασ σφό-δρα καὶ ἐλ|θοῦσαι εἰσ τὸ μνημεῖ |ον εἶδον νεανίσκον | καθήμενον ἐν τοῖσ | δεξιοῖσ περιβε-βλημέ|νον στολὴν λευκὴν | καὶ ἐξε-θαμβήθησαν | ὁ δὲ λέγει αὐταῖσ μὴ | ἐκθαμβεῖσθε ἶν ζη-τει | τε τὸν ναζα-ρηνὸν τ̄ | ἐσταυ-ρωμένον ἠγέρ|θη οὐκ ἔστιν ὧδε ἴδε | ὁ τόποσ ὅπου εθηκ̄ | αὐτὸν ἀλλα ὑπάγετε | εἰπατε τοῖσ μαθη-ταῖσ | αὐτοῦ καὶ τῶ π ἑτρῳ | ὅτι προάγει ὑμᾶσ εἰσ | τὴν γαλιλάιαν ἐκεῖ αὐ|τὸν ὄψεσθε κα-θὼσ εἶ|πεν ὑμῖν καὶ ἐξελθοῦ|σαι ἔφυγον ἀπὸ τοῦ | μνημείου εἶχεν γὰρ | αὐτὰσ τρό-μοσ καὶ ἔκ|στασισ καὶ οὐδενὶ οὐ|δὲν εἶπον ἐφοβοῦν|το γάρ :



Specimen of the Codex Vaticanus, containing Mark xvi. 3—8
From Dean Burgon's photograph of the whole page.

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The Witness of Codex Sinaiticus and Codex Vaticanus

Summary.

Codex Vaticanus (B) ends Mark's Gospel with v. 8 but the remainder of the column and the whole of the following (third) column, is left blank.

Codex Sinaiticus (ℵ) also ends with v. 8. but does not leave a blank column. However the remainder of the line after γάρ is filled with an arabesque.

Text ..... Early Alexandrian of the time of Origen (*250 A.D.).

Place .... Alexandria (?).

Time .... Probably before 350 A.D.

Inferences The scribes of B and of ℵ knew of a conclusion for Mark but did not consider it an authentic part of the Gospel.

Discussion.

It is most significant that the two oldest Greek MSS of the New Testament known, the two great fourth century codices, Sinaiticus and Vaticanus, our best representatives of the early Alexandrian text, the "Neutral" text of WH, agree in ending the Gospel according to Mark at 16:8. There is a difference however in the manner in which they bear this witness.

Codex Vaticanus (Gregory B, von Soden δ1) ends Mark at v. 8. followed by the ornament and the subscription κατὰ Μάρκον. The remainder of the column (the second) and the whole of the third is left blank. This is contrary to the usual custom of the scribe. The Gospel according to Matthew ends in the upper part of the second column of the page in a similar fashion, yet the Gospel according to Mark begins at the top of the third column. More significant still, in the case of Luke, which ends on the last line but one of the second column, the subscription together with the ornament is crowded into the lower margin, below the usual bottom of the page, instead of being carried over to the third column.

Though no such blank is elsewhere found in this codex, it is significant that "the same use of blank spaces is found in L at John 7:53–8:11, and also very instructively in $\Delta + G_3$." (WH. II. Notes, p. 29.)

Dean Burgon pointed out to the critics that this unique blank

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column indicates, on the part of the scribe of B, knowledge of the existence in his day of a conclusion to Mark. One may infer that the exemplar from which the scribe was copying also concluded the Gospel with v. 8 (so WH), though one cannot deny the possibility that he copied from an archetype in which, by some sign, the unauthentic character of the last twelve verses was indicated and this, possibly combined with his knowledge of the best current text, caused their omission.

Can we infer from this blank which of the two conclusions the scribe of B had in mind, the Longer or the Shorter?

Burgon argued (p. 87) that this space furnished "a blank abundantly sufficient to contain the twelve verses." Zahn, on the contrary, declares that even if we accept the conclusion of Scrivener (Vol. I. p. 106) that both the arabesque ornament and the subscription κατὰ Μάρκον are by a later hand, with the additional space thus gained the Longer Conclusion could not have been contained. He therefore concludes that the scribe knew the Shorter Conclusion (GK. II. p. 912). But, though agreeing that the space is insufficient to contain the Longer Conclusion, it does not seem a necessary inference that the scribe would measure out a blank space exactly corresponding with the space required for the copying of the conclusion with which he was acquainted. While it would be a most welcome support to our argument for the Egyptian origin of the Shorter Conclusion to find a witness for it in Codex Vaticanus, we are unable to infer more than that the scribe knew of the existence of a conclusion to the Gospel, which he did not feel authorized to copy. It is even possible that he knew of the existence of both conclusions, and his doubt was in part due to this fact. It is, however, evident that he considered the form of the Gospel which ended with v. 8. as the authentic one.

Codex Sinaiticus (Gregory ℵ, von Soden δ^2) also concludes Mark at v. 8, the last line "containing only the letters ΤΟΓΑΡ has the rest of the space (more than half the width of the column) filled up with a minute and elaborate 'arabesque' executed with the pen in ink and vermilion. nothing like which occurs in the whole MS (O.T. or N.T.), such spaces being elsewhere invariably left blank." So says John Gwynn, apparently the first to call attention to this fact, who argues from it that it implies a knowledge, on the part of the scribe, of a conclusion for the Gospel. (Scrivener's Introduction, I. p. 95, footnote dated May 21, 1883.)

Our own study of Codex Sinaiticus in both Tischendorf's edition and in the recent photographic edition of Kirsopp Lake (Oxford,

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Codex Sinaiticus, End of John's Gospel.
From facsimile of Helen and Kirsopp Lake, published by the Clarendon Press.

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CODEX SINAITICUS. Fourth Century.

(Scale 3 : 8. The page shown contains Mark xvi. 2-Luke i. 18, the last twelve verses of St. Mark being omitted. This is one of the pages written by the corrector, whom Tischendorf believes to be identical with the scribe of the Codex Vaticanus.)

From Kenyon's Handbook to the Textual Criticism of the New Testament.

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Clarendon Press, 1911) confirms this conclusion, and supplies additional particulars. They may be verified by the accompanying photographs, the conclusion of John being introduced as typical of the customary form of the close of the N.T. writings in this MS. It is to be understood that our study included only the New Testament in this codex. Examination shows:

1. Where the last words of a book do not fill the rest of the line, elsewhere the remainder of the line is invariably left blank. Here it is filled up with an elaborate arabesque.

2. The usual ornament consists of a single line, or at most an ornamented line, though Matthew shows an ornament consisting of two intertwining curved lines. Only at the close of I Thessalonians is there a form resembling this found at the end of Mark. The ornament there though in some respects similar is less elaborate. It is however a broken line crossed by a line of >'s and o's. But the last verses of I Thessalonians were copied by the same scribe who copied this folio of Mark, the scribe D who acted also as diorthota. The difference in ornament noted is therefore in part due to a difference of scribes, but apparently only in part. Tischendorf held that the last verses of John were not penned by the usual scribe of the N.T. (A) but by this scribe, D. There seems reason however to doubt this (compare the photograph).

3. At the end of the other Gospels the ornament is in black alone. Here it is in black and vermilion. Lake declares: "Red was used for the Eusebian apparatus, the earlier signatures to the gatherings, and in some of the 'Arabesques,' for instance at the end of Mark." Those who desire to verify this statement can do so with the aid of Tischendorf's edition, where all these are printed in red.

The marks above and below the letters of the subscription to Mark are not found about the subscriptions of Luke and John (Matthew has no subscription) and are not so marked nor so numerous at the close of any other book.

In a word, the manner in which the close of the Gospel according to Mark is indicated in ℵ is more elaborate and definitive than in the case of any other N.T. writing. The natural inference is that the scribe intended to indicate by this, in the most marked and definite manner possible without a note, that Mark certainly ended at the close of v. 8. It indicates, since his reason for so doing must have been due to the knowledge that not all MSS did end Mark at this point, that he rejected, at least as far as this codex is concerned, any conclusion for Mark. Whether in so doing he was thinking of the Longer or the Shorter Conclusion we have no means of determining.

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We find, therefore that the scribes of both B and ℵ knew of one or more conclusions of the Gospel which seem to have gained some currency by the fourth century, but which apparently were not yet looked upon as authentic. The best MSS they considered ended at v. 8. in which they agree with the testimony of Eusebius.

But have we in ℵ an independent witness, or simply a duplication of the witness of B?

Six leaves of ℵ, among them Fols. 28 and 29 on which Mk. 14:54–Luke 1:56 are written, were not copied by the usual scribe of ℵ but by a scribe who is usually designated D. Tischendorf identified this scribe with the scribe who wrote the whole of Codex Vaticanus. On the basis of this identification, accepted by Dr. Hort and many other critics, Dr. Scrivener argued that ℵ and B must be considered as furnishing one witness, not two. Lake however, in his recent edition of ℵ holds that Tischendorf was probably mistaken in this identification, and in proof presents on the same page specimens of the writing of the scribes of ℵ beside a column from Codex Vaticanus. This shows, as he claims, a greater difference between the scribe of Vaticanus, and scribe D of Sinaiticus than between scribes D and C of the latter.

But a solution of the problem of the identity or difference of the scribes of the two codices at the end of Mark is not required for a decision of the still more important question whether in these codices we possess two witnesses or only one, since the last verses of Mark in ℵ and B were evidently copied from different exemplars, as is shown by their text. Therefore, since ℵ and B go back to different exemplars, they must be considered two separate, if not in all points independent, witnesses.

However, for those who accept the identification of Tischendorf it furnishes an additional, though slight, support for the interpretation of the significance of the arabesque of ℵ given above, since if both codices were at this point copied by the same scribe, we might antecedently expect that in ℵ as in B he would furnish some indication of his knowledge of the existence of a conclusion for Mark. Since these sheets seem to have been written to take the place of canceled folios, he may have found it impossible to indicate his knowledge by a blank column as in B, and therefore have used this less obtrusive method,—which has been generally overlooked or ignored,—of an elaborate arabesque, to indicate his knowledge of an ending to Mark, current in his day, which nevertheless he rejected. Here again, we are unable to say whether this rejection was due to his knowledge of the best texts of the day, or to his faithfulness in copying his exemplar.

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On the other hand those who reject this identification will acknowledge that since these two MSS are to be dated at about the same time, and further seem to have issued from the same scriptorium, if the scribe of B possessed and indicated a knowledge of a conclusion, it would be quite possible that the scribe of the other MS possessed similar knowledge and indicated it, though in a different manner. Additional probability is afforded this supposition by the fact that so many of the witnesses which contain one or both of the endings indicate a knowledge that in some sense the text of Mark closed at v. 8.

The Provenance of ℵ and B.

Recent editors hold that these MSS were written in Alexandria or in Caesarea. The arguments for the latter view are as follows:

1. At one time ℵ was in the library at Caesarea as is shown by a colophon written by ℵ^{c} at the end of Esther, and also at the end of Ezra.

2. A chapter division in Acts contained in both ℵ and B is traced by J. Armitage Robinson to the library at Caesarea. He claims that it is a modification of the Euthalian system, and that it "probably stood in the margin of some Greek codex at Caesarea, anterior in date to ℵ and B." This may imply that "ℵ and B were at an early stage of their history lying side by side in the same library." ("Euthaliana" in Texts and Studies, III, 3, p. 101, 37f.)

But this does not demonstrate the Caesarean origin of the two codices since, as Lake points out in the Encyclopedia Britannica ("Bible"):

a) "It cannot be shown that the MS corrected by Pamphilus was still at Caesarea when it was used by ℵ."

b) "It is not certain that the chapter divisions in Acts were added by the original scribe."

c) It does not necessarily follow that at this time ℵ and B were in their original homes.

d) It cannot be proved that these chapter divisions were found only at Caesarea.

e) The Euthalian enumeration appears to be late, not earlier than the sixth and probably of the eighth century (so Lake in his introduction to the Codex ℵ).

For an Alexandrian origin the arguments are:

I. Palaeographical:

1. The Codex Sinaiticus contains no letters which we cannot parallel in the fourth or earlier centuries.

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2. All the peculiarities of ℵ are found in Pap. Rylands 28 as well as in B, a remarkable fact which suggests that these three MSS came from the same scriptorium.

II. Orthographical:

1. The spelling of κράββατος as ΚΡΑΒΑΚΤΟΣ ten out of the eleven times where it occurs in ℵ agrees with witnesses exclusively Egyptian, both of an earlier and later date than this MS.

2. The spelling of Ἰσραηλείτης as ΙΣΔΡΑΗΛΕΙΤΗΣ eight out of the nine times it occurs in the N.T. in ℵ is common to the Old Latin, both European and African, but in Greek codices it appears to be found only in ℵ and in B, in the latter in the form ΙΣΤΡΑΗΛΕΙΤΗΣ. This was one of the supports of WH theory of the Western provenance of these MSS, but this spelling is also found in the papyri of Egypt. "Thus the evidence for the spelling in Egypt is probably as early as any that can be adduced in Latin, and even if it be ultimately a Latinism it affords no argument against the Egyptian provenance of any individual MS."

III. The four column page of ℵ suggests close relationship with the papyri. In fact Scrivener declares that "either ℵ or its immediate prototype must have been derived from a papyrus exemplar, probably of Egyptian origin."

IV. "The remarkable similarity subsisting between the hands of the scribes who added the superscription to Acts in both MSS" indicates either the same scribe or two scribes in the same scriptorium; Prof. Lake is inclined to believe the latter. Now as Egyptian Papyrus Rylands 28 agrees with ℵ and B" in practically the only palaeographical pecularities they present" it seems most probable that these three MSS all came from the same scriptorium, and Rylands 28 indicates that it was in Egypt.

V. There is an extraordinary resemblance between the Psalms in the Coptic text of the Pistis Sophia and the text of ℵ in the Psalms.

VI. That the text of ℵB represents the recension of Hesychius has been argued by Bousset, and accepted by von Soden and many German scholars, but to some English scholars this does not seem to rest on a very solid foundation.

VII. No non-Alexandrian writer has been found who used the "Neutral" text, in spite of the contention of WH that this text, though connected with Alexandria, was not confined to it.

VIII. The archetype of B contained the epistles in an order found elsewhere only in the Sahidic Version. It may therefore be inferred that this was the Old Egyptian or Alexandrian order. This however

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may perhaps only prove that the archetype of B came from Alexandria, but scarcely that B itself must have been written there.

Prof. Lake, from whom most of these arguments are taken, concludes his discussion of the original provenance and date of Codex Sinaiticus, in the introduction to his edition of the same (p. xv) as follows:

> "It remains true that all the arguments from history, criticism, palaeography, and orthography combine to give the view that the codex is an Egyptian MS of the fourth century, a probability which cannot be approached by any other theory. It would be too much to call it certain: but short of this it may fairly be regarded as the hypothesis which ought to be used as the general basis of any discussion as to the critical value of the Codex Sinaiticus."

We therefore hold, a point of considerable importance for our discussion and therefore argued at some length, that ℵ and B are both to be traced to Egypt.

Text.

While to WH, ℵ and B are the great representatives of the so-called "Neutral" text, it is today recognized that they represent fairly well the quotations of Origen, the great Alexandrian scholar. The researches of Bernard into the text used by Clement of Alexandria indicate that in Alexandria itself an earlier and different type of text was employed at the end of the second and beginning of the third century. The text of Clement seems to have more in common with the Old Latin, or "geographically Western" text than with this "Neutral" text, though the quotations of Clement agree with no text as yet found either in the MSS or the versions.

If in Sinaiticus and Vaticanus we have representatives of the text of Origen, we may conclude that about the middle of the third century the last twelve verses were not considered an authentic part of Mark by the dominant text. With this conclusion agrees the fact that in the extant writings of Clement and Origen no trace of these verses have been found. And if, as we shall see later, Eusebius takes from Origen his testimony concerning the lack of these verses in the best Greek MSS, a supposition of Burgon adopted by some critics, we have additional support for this supposition.

The investigations of von Soden support these conclusions as to the text, for he holds that ℵ and B go back to a common original and that this common original is the best representative of the text called by him H, a text which represents and includes both the "Neutral" and "Alexandrian" texts of WH. This text he holds to have been

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contaminated by the Egyptian versions and also at times by the K and I texts, and by Origen, but not to any great extent. As to the origin of this type of text, he declares that it was "unquestionably Egyptian, in view of the fact that it was used by all the Egyptian Church writers after the end of the third century." (Condensed from the article "von Soden" by Lake in Encycl. Brit.).

Bibliography.

B was published in phototype "Biblorum Graecorum Codex Vaticanus," 1905.

ℵ was published in photographic facsimile by Kirsopp Lake, Oxford, Clarendon Press, 1911.

Lake's Introduction to the above and his article under "Bible" in the Encyclopedia Britannica discuss the arguments for the provenance of these codices.

BURKITT, Texts and Studies V, p. viii f. discusses the Egyptian character of B; and J. Armitage Robinson "Euthaliana," Texts and Studies, III, 3, 1895 discusses the possible relation of the modified Euthalian chapter divisions to Caesarea.

ZAHN, GK, II, pp. 911, 912 discusses the ending the scribe of B had in mind in leaving a blank at the close of Mark.

CURSIVE 22

Cursive 22 was brought into prominence in this discussion by Burgon, who first pointed out its peculiarities (p. 230 cf. WH II, Notes, p. 30).

Its witness is as follows:

φοβοῦντο γάρ + τέλος +
⁜ ἔν τισι τῶν ἀντιγράφων.
ἕως ὧδε πληροῦται ὁ ἐυ
αγγελιστής: ἐν πολλοῖς
δὲ. καὶ ταῦτα φέρεται +
Αναστὰς δὲ. πρωΐ πρώτη σαββάτων.

'Εφοβοῦντο γὰρ + is followed by τέλος + in red in the text. On the next line the interesting note follows, still in red and in the same hand, but written in shorter lines. This is followed immediately, on the next line, by the Longer Ending, at the close of which is again found + τέλος + which sign, Burgon declares "*occurs nowhere* else in the MS. *nor at the end of any other Gospels*" (sic).

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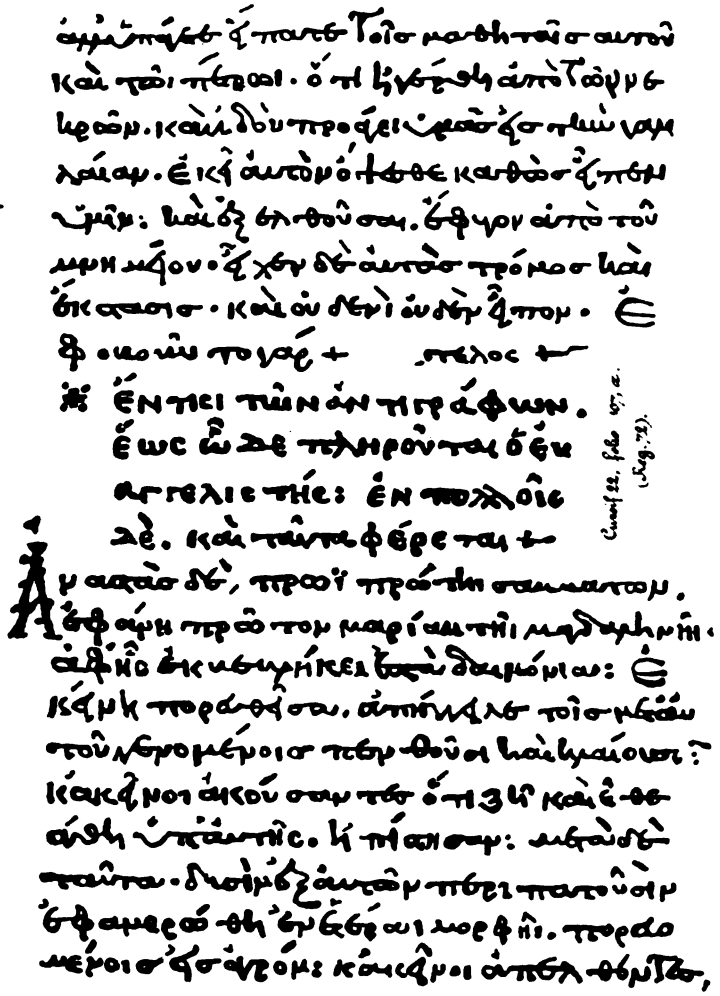

Cursive 22. From Abbé Martin's Introduction à la Critique textuelle du N. T.

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This MS was never prepared for liturgical use, though a later hand has scrawled roughly here and there indications of the beginnings and endings of a few of the lections. The colophon, on the other hand, as a reference to the accompanying plate will show, is original, and not a later addition.

Of course both Burgon and Martin argue that here the τέλος is a vestige of a distant liturgical exemplar, but, as Dr. Hort argues, it is not possible to explain the phenomena of 22 and the other MSS which have τέλος at this point simply on the basis of liturgical use. Rather this MS indicates that in some sense the Gospel is understood to end at v. 8, in some sense at v. 20. In time there naturally arose, in all probability, a confusion of this τέλος with the liturgical τέλος, which would be the more natural as a lection did end with v. 8.

This interpretation is supported by the similar but independent testimony of certain ancient Armenian codices where εὐαγγέλιον κατὰ Μάρκον follows both v. 8 and v. 20. We must infer that such texts were derived ultimately from an exemplar which ended with verse 8.

In this connection it is interesting to note that precisely the same rubric is found in cursive 15 (Paris 64, Sd ε 283) at the bottom of the verso of folio 98 (not in the lower margin, see the reproduction by Martin p. 516). The recto of folio 99 reads at the top as the page title the abbreviation for εὐαγγέλιον ἀναστάσιμον γ̄ κατὰ Μάρκον in vermilion, followed by the words Ἀναστὰς ὁ Ἰ̄ in gold. The page contains the Longer Ending, immediately followed, whether on the last line or in the lower margin it is hard to determine, by the subscription in vermilion, written between ornaments of black

: τιλοιπῦκαΤὰμαρκονεὐαγγε :

This MS is most interesting as showing how easily and simply, by the loss of a leaf, the last twelve verses could be separated from the rest of the Gospel.

Cursives 20 and 300 (Paris Nat. Gr. 188 and 186, Sd A 138 and A 141) which are derived from a common exemplar contain the scholion ἐντεῦθεν ἕως τὸ τέλος ἔν τισι τῶν ἀντιγράφων οὐ κεῖται. ἐν δὲ τοῖς ἀρχαίοις πάντα ἀπαράλειπτα κεῖται, that is to say, "from here to the end forms no part of the text in some of the copies. In the ancient copies, however, it all forms part of the text."

Burgon makes much of the fact that in both these MSS the scholion appears in the wrong place at the end of v. 15. But Martin shows that this is a mere accident, due to the fact that it was written at this point in the margin, solely because there was a blank space here,

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and then the scribe carelessly neglected to place in the text at the close of v. 8 the sign which would direct attention to it.

The fact that in cursive 300 at the end of Matthew (f. 89) is written ἐγράφη καὶ ἀντεβλήθη ἐκ τῶν Ἱεροσολύμοις παλαιῶν ἀντιγράφων and after Mark εὐαγγέλιον, κατὰ Μάρκον ἐγράφη καὶ ἀντεβλήθη ὁμοίως ἐκ τῶν ἐσπουδασμένων, the second colophon (not the first) being found in Cod. 20 and both appearing in codex 262 (Paris 53, Sd ε1020), is of interest, but need prove no more than that the exemplar, from which these MSS were copied, had been "collated with the ancient and approved copies at Jerusalem." (Martin, p. 420, cf. Burgon, p. 119.)

The Syriac Versions

Summary.

Sinaitic Syriac.

In the Sinaitic Syriac (Ss) Mark ends at 16 : 8 followed by the usual subscription.

Text .... Early "Western," as read in Antioch about 150 A.D.
Date .... 150 A.D. (Others 200 A.D.).
Place .... Probably Syria.
Inferences The earliest Syriac version agreed with ℵB in ending Mark at v. 8.

The Diatessaron of Tatian.

The Diatessaron of Tatian (T) included the Longer Conclusion, our earliest certain witness to it.

Text .... Early "Western," of the type current at Rome.
Time..... 172 A.D.
Place .... Probably issued at Edessa, but representing, in contents, the tradition of the church of Rome.
Inferences The Longer Conclusion seems to have been introduced into the East by Tatian, who brought it from Rome, where it had gained a recognized place in the official text before 170 A.D.

Curetonian Syriac.

The Curetonian Syriac (Sc) shows the Longer Conclusion.

Text .... Early "Western" Greek text as read in Antioch about 200 A.D.
Date .... 200–250 A.D.

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Place .... The region of Antioch.
Inferences Through the influence of Tatian's Diatessaron, the Longer Conclusion gained a recognized place in the Old Syriac Version.

Peshitto.

The Peshitto (Sp) contains the Longer Conclusion alone in all MSS, save one where it has been accompanied by the Shorter Conclusion in the margin, due to the influence of later versions.
Text .... The Greek text current at Antioch about 400 A.D.
Date .... 411 A.D.
Place .... Edessa.
Inferences By the fifth century the Longer Conclusion had gained undisputed position in the Syriac versions.

Harclean Syriac.

The Harclean Syriac contains the Shorter Conclusion in the margin of at least two MSS.
Text .... The Greek Text of Alexandria about 600 A.D.
Date .... 616 A.D.
Place .... Alexandria.
Inferences In one or more MSS found at Alexandria at the beginning of the seventh century the Shorter Conclusion was found.

Discussion.

To rightly weigh and estimate the evidence of the Syriac versions a brief discussion of the relations of our earliest representatives of the Gospels in Syriac will be necessary, since, as Burkitt says, "almost everything that relates to the origin and early history of the Syriac versions is the subject of controversy." While following in the main the theory of Prof. Burkitt, "the convincing theory which at present holds the field" (Norman M'Lean in Encycl. Brit.), we follow Mrs. Lewis, Hjelt, Merx, Blass, and others in considering Ss earlier than T.

Tatian supplies us with a fixed date for our discussion, for we know he went to Rome about the middle of the second century, became a follower, and later a fellow worker of Justin Martyr, through whom he may have been converted to Christianity, and after some years residence departed for the East about 172 A.D., a date fixed with considerable certainly by Zahn (Forschungen, I, p. 283).

Returning to Syria he completed and issued, perhaps at Edessa, his Diatessaron or Harmony of the Four Gospels, in the Syriac language. This work attained great popularity in the Syrian Church, and became

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the form in which the Gospels were publicly read in the churches of Edessa, as we learn from the "Doctrine of Addai," an apocryphal work which seems to preserve the popular tradition of Edessa at the close of the fourth century. It reads:

> "[Now much people day by day] were gathering together and coming to the prayer of (Divine) Service and to the Old Testament and the New of the Diatessaron; and in the Resurrection of the dead they were believing. . . ." (xxxv. 15–17).

Thus we see the Doctrine of Addai transfers the Diatessaron to apostolic times (so Wright, History of Syriac Literature, p. 8).

While still at Rome he probably commenced his Diatessaron, and it is quite likely that Justin Martyr knew and approved his undertaking (cf. Hill, "The Earliest Life of Christ," Introd. p. 9). Whether this work was originally in Greek (or Latin) and was afterwards translated into Syriac, as Harnack, Burkitt, and others hold, or was originally prepared in the Syriac, does not vitally concern this discussion, if it be granted that in the compiling of his work, *as to its contents* Tatian would include what was found in the Greek texts of the Gospels current at that date in Rome, with which he would of course be familiar.

Since it has never been proved that Tatian included in his compilation a passage of any considerable length taken from any other source than our canonical Gospels, and since the Longer Conclusion is worked over into the Harmony, for "this same mosaic of Mt. 28, Mk. 16, and Lk. 24 is found in fuld [Codex Fuldensis] as in the Arabic Diatessaron. Aphaates 120 mentions Christ's ascension at the right hand of the Father (Mk. 16 : 9) immediately after quoting Mt. 28 : 20," (Burkitt, Encycl. Bib., col. 5003, note), we conclude that at Rome in 170 A.D. these twelve verses were accepted as an authentic part of our canonical Gospels, and if so none will deny that they must have formed then as now the closing section of the Gospel according to Mark. If they did not originate at Rome, they must have been brought to that city as early as the middle of the second century.

This conclusion will of course be affected somewhat by the view one takes of the language in which the Diatessaron was originally compiled. If the original form was in Greek this conclusion is much strengthened, but if, from the first, it was composed in Syriac, it seems natural to suppose that, as to content, the tradition of Rome would be followed.

As to language, however, we believe that Tatian made use of and in part borrowed from an earlier Syriac version of the Gospels, as

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Zahn, after an exhaustive investigation, had concluded even before the discovery of Ss. At the same time he concluded that this version of the Old Syriac used by Tatian must have been made about the middle of the second century, from a Greek text similar to D and the oldest Itala MSS. (Cf. Hasting's D. B. Extra, p. 459.)

At this time the Curetonian was the only form of the Old Syriac known, and Zahn proved that T and Sc had influenced one another (Forschungen I).

But Baethgen proved that this relationship was due to the influence of T on Sc, and therefore the Diatessaron was the earlier of the two (Evangelienfragmente, Leipzig 1885, pp. 58ff.). Hort had already conjectured that Sc had "degenerated by transcription and perhaps by irregular revision." (Cf. WH. II, Par. 118.)

Much additional light was thrown upon this problem by the discovery of the Sinaitic Syriac by Mrs. Lewis in 1892. Our study of Ss leads us to the conclusion that it is older than Sc (so argues Conybeare, Bewer, and others) and further we believe Ss to be older than the Diatessaron. Since at this point we depart from the accepted theory of Burkitt and agree with the views of Mrs. Lewis, Hjelt, Merx, Blass, Stenning, Bewer, and others, it will be well to support this conclusion by a presentation of some of the arguments in its favor.

Stenning affirms:

> "A comparison of the text of Ss with that of Sc shows that those peculiar features of the text which clearly pointed, in the case of the latter, to the influence of T are by no means so strongly marked, if not entirely wanting, in the former. This divergence of text is especially noticeable in respect to the harmonistic and 'dogmatic' readings which undoubtedly form the main support of Baethgen's argument as to the relation of Sc to T." (Hasting's D.B., Extra.)

Burkitt, who at first held to the priority of Ss though now considering T the earlier, confesses:

> "Some of the readings characteristic of that MS [i. e. Ss] are quite contrary in tendency to what we otherwise know of Syriac Christianity, and that such a text should exist at all is a remarkable testimony to the essential faithfulness of the translator to the Greek text before him. The Diatessaron much nearer reflects the tendencies of the time. *In fact some things which we know to have stood in the Diatessaron almost read like a deliberate protest against the text of Syr. vt. as represented by the Sinai palimpsest.*" (Italics our own.) (Encycl. Bib. col. 5003):

Hjelt, after a careful study of the relations of Ss to T (Die altsyrische Evangelienübersetzung und Tatians Diatessaron besonders

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in ihrem gegenseitigen Verhältnis. Forschungen vii, i, pp. 107–162) declares (p. 155):

> Dass "In den Fällen, wo Ss und T von einander abweichen, der erstgenannte in der Regel eine Textgestalt aufweist, welche als die ursprünglichere und ältere erscheint. Ss bezeugt durchweg, dass die Verfasser von Syr. vt. keine textkritische Intentionen hatten, sondern den einzigen praktischen Zweck verfolgten, das geschriebene Evangelium in volkstümlicher, verständlicher Form ihren Landsleuten zugänglich zu machen. Daher die harmlose Unbefangenheit und Freiheit, womit sie ihre Übersetzung ausgeführt haben. Anders verhält es sich mit Tatian. In ihm sehen wir den theologisch interessierten Textkritiker. Er hat die von ihm vorgefundene altsyrische Evangelienübersetzung einer durchgehenden Revision auf Grund des ihm bekannten griechischen Textes unterzogen, offenbare Fehler und Mißverständnisse korrigiert, Ausdrücke und Wendungen, die ihm allzufrei oder ungenau schienen, geändert, andere Lesarten, die er vorzog, aufgenommen usw."

And Bewer (The History of the New Testament Canon in the Syrian Church, Chicago, 1900) who concludes that different Greek texts underlay Ss and Sc, says (p. 13):

> "Both Texts are very old, dating certainly from the second century; but Ss is older than that of Sc; compare for this the first chapter of Matthew relating the birth of Jesus, and the omissions as well as the sometimes curious additions."

> And Burkitt, at the close of his argument for the priority of T to the Evangelion da-Mepharreshe, makes the significant admission:

> "It is possible that the date assigned in the foregoing paragraphs to the Evangelion da-Mepharreshe is too late and that the version may have originated in the epoch of the first mission, the times of Addai and Aggai." (Evangelion da-Mepharreshe, Vol. II, p. 210.)

Mrs. Agnes Smith Lewis, the discoverer of Ss, whose recent edition must supersede all others, declares in her introduction that Merx, Hjelt, and Blass studied this MS "with the ardor born of a conviction that they were dealing with a text of the second century anterior to Tatian: in fact, with the earliest translation of the Four Gospels into any language." ("The Old Syriac Gospels," Introd. p. v.)

As for the date of the Peshitto, we need only express our agreement with the theory which Burkitt seems almost to have proved to a demonstration, that it was made by Rabbula, bishop of Edessa in 411 A.D, to take the place of the Diatessaron, and that it followed the Greek text current at Antioch at that date. (For Burkitt's arguments see "Evangelion da-Mepharreshe," II. pp. 161–165.)

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Considering that the true relation of these Syriac texts is indicated by the order Ss, T, Sc, Sp, we conclude:

1. The Old Syriac as represented by Ss is to be dated as early as the middle of the second century. It must have been made from a form of text which concluded Mark at 16:8, since the lack of the twelve concluding verses "can only be a Greek variant and must therefore represent the original form of the Old Syriac," (Burkitt in the Guardian, Oct. 31, 1894). Burkitt would date Ss about the beginning of the third century. Whichever date be adopted Ss furnishes us with a witness which confirms the testimony of ℵ and B that an early form of Mark concluded the Gospel with the eighth verse.

2. Our present evidence implies that the Longer Conclusion was introduced into the Syriac versions through Tatian, who found these twelve verses in the Greek MSS used at Rome in 172 A.D., and therefore included them in his Diatessaron.

3. The Old Syriac soon became affected by the popular Diatessaron. Both consciously and unconsciously the scribes who copied the former would be influenced by the versions publicly read in the churches. In a later revision of the Old Syriac it was brought into closer conformity with the current Greek text, and also probably to the Diatessaron, and the Longer Conclusion was added, as is shown by Sc. Probably this occurred about the beginning of the third century, though it may not have been accomplished until the middle of that century. Sc is therefore a witness to the Greek text as read at Antioch about 200 A.D.

While it is conceivable, as has been suggested, that in Sc or its archetype the Shorter preceded the Longer Conclusion, as in L and the uncials of the double conclusion, this does not seem probable.

4. The Peshitto, a revision of the Old Syriac made by Rabbula in 411 A.D. to conform it to the current Greek text preserves for us the text of Antioch about 400 A.D. It testifies that prior to the fifth century the Longer Conclusion had become an accepted part of the Gospels in the Syriac Testament, as well as in the Greek MSS known in this region, for G. H. Gwilliam, who collated over forty MSS for his edition of the text of the Gospels in the Peshitto declares:

> "Inter vv. 8, 9, interpungimus c. codd, mult.; in manu prima exarati, statim sequuntur, aeque et in omnibus, quibus postremum S. Mar, folium non deest; nec in eis unquam invenimus signum in textu, nec notam in margine, nec scholion subscriptum, quae posteriorem cap. xvi partim in suspicionem vocent."
>
> (Tetraevangelium Sanctum, Oxford, 1901, p. 312, note.)

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Abbe Martin, however, tells us, (p. 398) that the Shorter Conclusion is found in the margin of MS, Add. 14, 456, a fact which need not surprise us since this MS has been enriched by a number of notes added from the Philoxenian Version, in which term he probably includes the Harclean Version.

The Philoxenian Version was made in 508 A.D. by Polycarpus, a chorepiscopos, for Philoxenus, bishop of Hierapolis (Mabug). It seems to have been a revision of the Peshitto, adding those books of the Greek canon (2 Peter, Jude, 2 and 3 John, and Revelation) which were lacking in the current Syriac version.

In 616 A.D. this version was revised by Thomas of Harkel (Heraclea), bishop of Hierapolis. This revision was made near Alexandria, and was designed to represent the Greek as closely as possible, even to the order of the words. Scrivener calls it "probably the most servile version of Scripture ever made." We know that in the revision of the Gospels Thomas of Harclea had two (or three) Greek MSS probably from the library of the monastery at Enanton, a village "nine" miles from Alexandria. To indicate the various readings found in his MSS the critical symbols of the asterisk and obelus were used, as well as marginal notes.

The Shorter Conclusion is found in the margin of two MSS of this version, one Rom. Vat. Syr. 268, of an unknown date, which Mai thinks Thomas of Harclea wrote with his own hand in 615 A.D. and the other a MS in the Library of the New College, Oxford, used by Joseph White in his edition which in reality presents us with the Harclean text, though it i entitled "Sacrorum Evangeliorum versio Syriaca Philoxeniana, Oxford, 1778. The text of these two MSS, save for a couple of insignificant variations, is the same, and presents an exact translation of the Greek. The text of the Vatican MS is found in Martin, II, p. 398.

It is evident therefore that in one or more of the Greek MS of Alexandria, used by Thomas at the beginning of the seventh century, the Shorter Ending was found. His version therefore furnishes us with another indication of the Egyptian origin of the Shorter Conclusion.

The testimony of the Syriac versions therefore tells us:

1. The Greek text as known at Antioch about 150 A.D. did not contain any conclusion to Mark.

2. The Greek text as known at Rome in 170 A.D. contained the Longer Conclusion. Since by this date it seems to have been accepted as unquestionably a part of the Gospel, it must have reached Rome by 150 A.D. at the latest.

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3. The Greek text as known at Antioch about 200 A.D. contained the Longer Conclusion. Probably the Diatessaron had much influence in securing its admission.

4. By 411 A.D., when the Peshitto was issued, the Longer Conclusion had an undisputed place in the Syriac N.T.

5. The Shorter Conclusion was introduced into the margin of the Harclean Syriac from Alexandrian MSS in 616 A.D.

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The Armenian Version

Synopsis.

Testimony The ending is scarcely found in the early MSS before the thirteenth century and is wanting in half the later MSS.

Text .... Probably from the Old Syriac, later revised by Greek MSS from Constantinople. The text is similar to ℵB.

Place .... Armenia.

Date .... Latter part, or possibly early part of fourth century.

"Of the Presbyter Ariston."

Testimony The earliest known Armenian MS to contain the longer ending, the Edschmiadzin Codex, has inserted before v. 9ff "Of the Presbyter Ariston."

Text .... Probably the exemplar was an Armenian text of the early half of the sixth century from Edessa.

Place .... The monastery of Noravank (= New Monastery).

Date .... 989 A.D.

Inferences 1. We have no evidence that this rubric "Of the Presbyter Ariston" contains an early tradition, since it cannot be traced back of the MS in which it is found.

2. We have no proof that it is a trustworthy tradition, since it has not yet been found outside this MS.

3. We do not *know* with whom the "Ariston" of the rubric is to be identified.

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Therefore we hold that the authorship of the last twelve verses of the Gospel according to Mark still remains an open question.

Discussion.

The Armenian version furnishes us with a possible clue to the authorship of the longer ending, which in one Armenian codex is prefaced by the words "Of the Presbyter Ariston." Before discussing this evidence, however, we must first investigate the history of the version.

From what language was the Armenian version translated? Both Syriac and Greek are mentioned as its source. Both languages were used in Armenia, It may be inferred that both Syriac and Greek authorities were used in the preparation of this version.

Statements from three Armenian writers of the fifth century seem to imply this. Their testimony is by no means identical, and yet it combines "a certain conflict of assertion with a suspicious family likeness" (Robinson). From a combination of these statements it has been inferred that S. Mesrop, with the assistance of a Greek scribe Hrofanos (Rufinus, probably) prepared a translation based upon the Greek text, and S. Sahik (Isaac) a translation based upon the Syriac (So Lake and Kenyon). This first translation is dated about 395—400 A.D. (Kenyon).

On the other hand J. Armitage Robinson in his careful study (Euthaliana, p. 72ff.) declares: "One fact seems to stand out distinctly after the perusal of these puzzling statements [i. e. of the three early Armenian writers] that the earliest attempts at translating the Scriptures into Armenian were based on Syriac Codices."

For the Syriac origin of the Armenian version it may be argued:

1. The geographical position of Armenia makes it probable that Christianity would be introduced into it from Syria, and it would be most natural that the Syrian evangelists would bring and use their own Syriac version.

2. Syriac was the early ecclesiastical language of the Armenian Church as we learn from the tradition which states that up to the time of S. Mesrop and S. Sahik the Syrian language was used in the Armenian services, which were therefore unintelligible to the mass of the people.

3. Much of the early Armenian Christian literature was translated from famous Syrian fathers, as Ephraim and Aphrahat, and when, about 400 A.D. the church history of Eusebius was given to the

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Armenians in their own tongue, it was translated not from the original Greek but from a Syriac MS.

4. Third Corinthians was considered canonical in the Armenian Bible up to the seventh century. But the only other canon which contained it, so far as we know, was the Syriac, where it had a place in the first half of the fourth century.

5. Theodore, an Armenian writer of the seventh century declares that the ancient Armenian version contained Luke 22 : 43, 44 and 3 Corinthians and that Gregory the Illuminator, the apostle of the Armenians, quoted the latter at the beginning of the fourth century.

If this statement is correct, it would imply that nearly a century before the translation of Mesrop and Sahik there was a translation of the Gospels and the Epistles in Armenian and that the source of this translation was Syriac.

The above is confirmed by the researches of Robinson, who shows that traces of these primitive readings from the Syriac are still to be found in the Armenian vulgate. (Euthaliana, pp. 76–98.) Conybeare, Burkitt, and Kenyon accept these results of Robinson, who has shown that the above is true not only of the Gospels, but of the epistles, the latter showing a resemblance to the Syriac text used by Ephraim.

6. The colophons usually found at the end or beginning of each Gospel in the Armenian declare that Matthew wrote in the Hebrew language, Mark in the Egyptian tongue, Luke in the Syrian language, and John in the Greek tongue. These colophons which give but one Gospel a Greek original seem to imply, as Conybeare suggests, a rivalry between the Syrians and the Greeks in which the Armenians sided with the Syrians.

We infer therefore that the Armenian version had certainly, though possibly not exclusively, a Syrian origin.

From what Syriac text was this version made ?

Such coincidences as have been discovered between the Armenian and Syrian versions point not to the Peshitto but to the Old Syriac. From this we must infer that at the time when the Armenian version was made the Peshitto was not established as the authorized version of the Syrian Church, and also that the Old Syriac held a more important place in the early Syrian Church than was at first recognized, since it was made the basis for a missionary version. This also gives to the Armenian version far greater importance and weight than was formerly conceded to it, since it thus becomes a very important witness to the Old Syriac readings in places where at present we do not possess the testimony of Old Syriac MSS. (So Robinson.)

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The above arguments make out a fairly strong case for the Syriac parentage of the Armenian version and prove, moreover, that a translation into the Armenian was made not later than the end of the fourth century, and that very probably the earliest version is to be dated as early as the early part of that century (So Conybeare and Kenyon).

That the Armenian Church existed before the middle of the third century we know from the statement of Eusebius that Dionysius, bishop of Alexandria (248–265 A.D.), wrote a letter to the Armenians, the name of whose bishop was Meruzanes.

But while the origin of the Armenian version is obscure, we have clear testimony to its revision, for after the council of Ephesus (431 A.D.) the disciples of Mesrop brought to their master "certain trustworthy Greek codices" from Constantinople, by which the earlier translation was revised. Conybeare dates this revision at 439 A.D. (H.D.B. I. p. 153.)

The Greek text from which this revision was made was, so far as can be determined, not the Antiochean but one akin to ℵB, for there are but few readings in the Armenian which are not attested by ℵB or by the Old Syriac, and these few may have arisen from later chance corruptions (so Burkitt, Encycl. Bib. IV. col. 5011).

The Armenian MSS known are most of them late, the earliest seeming to be in Moscow, dated 887. We have a few MSS of the tenth and eleventh centuries containing the Gospels, but the remaining books of the N.T. are rarely found in MSS before the end of the thirteenth century.

Kenyon's assertion that the late MSS are less trustworthy, being affected by the introduction of the Vulgate into the East, is flatly denied by Conybeare, who declares, "One codex of the Armenian Bible differs very slightly from another."

The testimony of the Armenian MSS concerning the longer ending is most interesting and significant. It is scarcely found in MSS before the thirteenth century (Conybeare) and is wanting in half the MSS since the time of the crusades (Martin, quoted by Zahn). When Armenian MSS do contain the longer Ending, after the words corresponding to ἐφοβοῦντο γάρ there is written the colophon "Here ends Mark's Gospel" (Martin declares that in addition to the subscription there is a jagged line) and then after a pause, they continue with vs. 9–20 (So Conybeare). We are further told (WH Notes p. 30) that among the more ancient MSS some have εὐαγγέλιον κατὰ Μάρκον after v. 8 and again after v. 20. These verses are omitted in Zohrab's edition of the Armenian (So Horner in his edition of the Sahidic Gospels notes).

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In his second article "On the Last Twelve Verses of St. Mark's Gospel" (The Expositor, December, 1895, p. 403), Conybeare has the following discussion of MSS which seems of sufficient interest and importance to quote in full:

"In the Mechitarist library on the island of San Lazaro at Venice, is a codex of the Gospels dated A.D. 902, by consequence nearly a hundred years earlier than the Edschmiadzin copy. In this codex v. 8 ends the second column of a verso. The same marginal writing was continued on the recto side of the next folio but there is not more of it than would amount to verses 9–13. It is, however, too obliterated to be read without chemical treatment. I examined it carefully, and satisfied myself that the writing so erased was not any part of the twelve verses—a very curious and important fact. There is too much of it for it to have been the alternative ending of Mark found in the Greek uncial codex L. Perhaps the scribe herein gave his reasons for omitting the last twelve verses. The verso side of the folio is left blank and the entire pericope could hardly have been contained even on both sides.

In an Armenian codex of the four Gospels belonging to the Bodleian library and dated 1304, the scribe seems to have originally written the last twelve verses in the second column of the recto of fol. 141 and in both of the verso, but to have himself afterwards effaced them, adding the last line of verse 8 at the bottom of the right-hand column of the recto side of folio 141.

In more than one Armenian codex, where these verses occupied a folio by themselves, that folio has simply been cut out. In a 13th or 14th century codex at San Lazaro in Venice there is prefixed to the verses the notice, "This is unauthentic." In the Bodleian Armenian codex of the four Gospels, dated A.D. 1355, a notice is prefixed as follows: "This is an addition." Many codices of the four Gospels, and also of the entire Bible, end the Gospel according to Mark at verse 8, and then after a space proceed with the twelve verses. This is so in the case of the oldest San Lazaro Bible, dated 1220, and of a Bible in the collection of Lord Zouche later in date but copied from an early archetype. In such cases the words "The end of Mark (*or* of Mark's Gospel)" is added after v. 8.

As to the evidence of the Armenian lectionaries, Conybeare says that is only modern, but declares that the oldest known, probably of the ninth century, did not contain vs. 9–20. This is an uncial codex now in Paris. It would seem therefore that these verses, in the early Armenian church, were not read on Ascension Day, as in other

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churches. However since the twelfth century it has been customary in the Armenian Church to use this lection, and the equivalent of "For Ascension Day" is usually written against v. 9. in Armenian MSS written since that time.

These twelve verses probably belonged to the original Armenian version of the Gospels, prior to the revision of Mesrop early in the fifth century, but were afterwards excised.

This is hinted by some of the above evidence and also by the fact that in the fifth century vs. 17 and 18 are quoted in almost precisely the form we have them in the present Armenian version, by Eznik, a fellow worker of S. Mesrop and S. Sahik, in his work on Heresies, Book I which Conybeare dates 420—430 A.D. Conybeare also notes "plentiful citation" of these verses in the Armenian Acts of Pilate which version "must be almost as early as the sixth century." Again the text is the same as found in such Armenian codices as contain the longer ending.

But we know of other parts of the Armenian version of the fifth century which were omitted from the later Armenian canon, as the Apocalypse. Moreover the pericope adulterae is absent from the oldest MSS though cited by Gregory of Narek in 950 A.D.

But, though absent from all other known codices prior to 1100 A.D. Dr. F. C. Conybeare has found the longer ending in a most interesting MS in the Patriarchal Library at Edschmiadzin at the foot of Mount Ararat, which is said to be the most important library in Armenia. This earliest known codex to contain the longer ending is also the oldest codex to contain the pericope adulterae, though in an ancient and unusual form.

This uncial codex was written in 989 A.D. (not 986 as stated by Conybeare in his first article, a mistake which Swete has perpetuated, though it was early corrected by Zahn). Before the last twelve verses has been inserted *Ariston Eritzou* "Of the Presbyter Ariston."

Of the Presbyter Ariston.

In the Expositor for October, 1893 Mr. F. C. Conybeare stated that in November 1891 he had collated at Edschmiadzin a codex of the Gospels in which the last twelve verses were prefaced by the words "Ariston Eritzou" "Of the Presbyter Ariston."

The following later and more accurate description is given by Dr. Conybeare in Swete p. civ (cf. the description in the original article in the Expositor, Oct. 1893, p. 243).

> "In this codex verse 8 of ch. xvi. ends at the beginning of a line, in the second column of a page. The line is partly filled up with

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the vermilioned flourishes which indicate that the Gospel proper of Mark is ended. Verse 9 however is begun on the next line, and the whole twelve verses are completed in the same large uncials as the rest of the Gospels. As it were by an afterthought the scribe adds the title *Ariston Eritzou* just above the flourishes mentioned, and within the columnar space. It is written in vermilioned smaller uncials identical in character with those which at the foot of each column denote the Ammonian canons, and also with those which the scribe uses to complete a word at the end of a line, thereby preserving the symmetry of the lines, and avoiding the necessity of placing the last one or two letters of a word by themselves at the beginning of a fresh line. The title therefore was added by the first hand; or, if not by him, at least by the διορθωτής. In any case it is contemporary, and must have stood in the older copy transcribed, from which also were perhaps transferred the fifth century full-page illustrations included in the existing codex. At first it was intended to omit the title, but on second thoughts it was added. If the scribe had from the first meant to keep it, he would have left room for it, instead of cramping it in above the terminal flourishes. That he regarded Mark proper as ending with verse 8, is further shown by the large circular boss consisting of concentric circles of color added against the end of verse 8 between the columns. The paler tints in the photograph correspond to vermilion in the codex; and the vermilioned lettering of the title was so faint in the positive sent to Mr. Conybeare from Edschmiadzin in 1895, that he has strengthened it with ink for the preparation of the present facsimile."

This rubric could not indicate the copyist, whose name the codex gives as Johannes, nor the translator of these verses, since Ariston is not an Armenian name, but must mean the original author of these verses. This alone, declares Conybeare, explains the genitive case "*Of the* presbyter" used here, [note that the name Ariston is not in the genitive] and "the dignity accorded to the words 'Ariston Eritzou,' which are in minioned uncials, as are the titles 'of Matthew' etc. . . . at the heads of their respective Gospels."

But reference to the facsimile to us seems to infer not the dignity of these words, but rather lack of it, since they are not even given a separate line but crowded in between the lines in a much smaller hand than the rest of the text. Since the facsimile does not give the title of the Gospel, we can make no comparison with it. We must take exception however to the inference that Ariston "must in the scribe's mind have been a writer of almost the same importance as Mark him-

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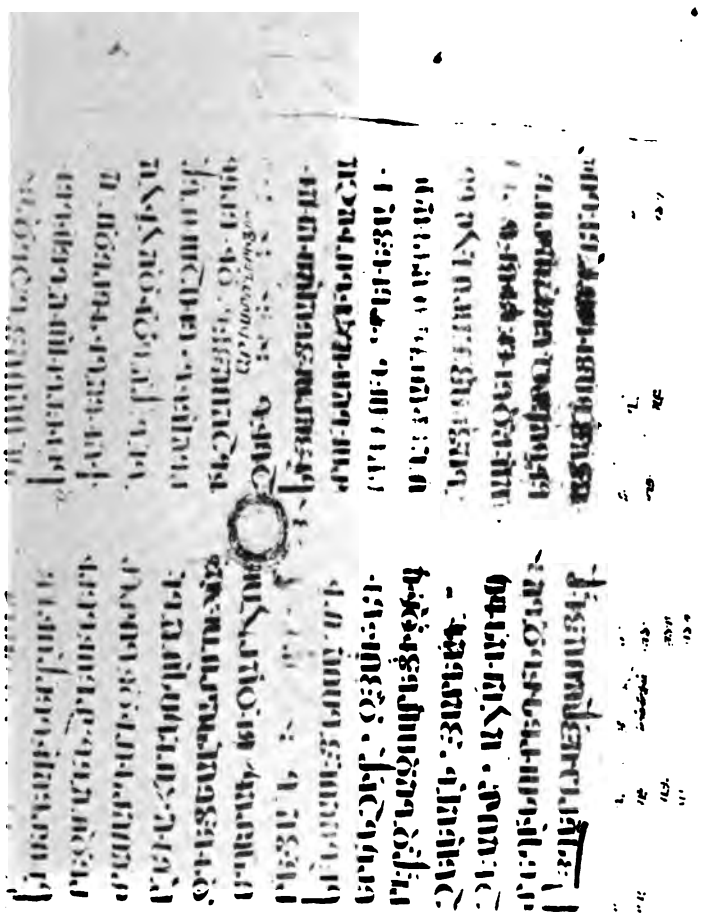

Edschmiadzin Codex, with "Ariston Eritzou", inserted before the last twelve verses of Mark.
From Swete's, The Gospel according to St. Mark.

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self to judge from the prominence given to his name, and the red uncials in which it is written."

We further take exception to Conybeare's inference that the translator of these twelve verses into the Armenian must have had a Greek or Syriac MS in which they were prefaced by the words Ἀριστίωνος πρεσβυτέρου. The opposite seems to us to be more probable since:

1. The scribe clearly indicates that in some sense he considers the Gospel to end at v. 8 since he has filled the remainder of the last line of this verse with the vermilion flourishes by which he indicates the close of a Gospel.

2. He has at this point inserted the boss which further indicates the end of the Gospel at this point.

3. The scribe does not give a line to this rubric but crowds it in as an afterthought. As Conybeare acknowledges, "if the scribe had from the first meant to keep it, he would have left room for it, instead of cramping it above the terminal flourishes."

4. Even acknowledging that the insertion is contemporary with the original transcribing of the codex, it may have been inserted not by the scribe but by the διορθωτής, as Mr. Conybeare acknowledges. This admission seems to us to seriously weaken his argument for the existence of this rubric in the exemplar.

This codex was written by the scribe Johannes at the commission of a monk and presbyter, Stephanus, who in a note he appends to the book declares "this book is to be read in this church, for it is copied from authentic and old originals" (Strzygowski, Byzantische Denkmäler, I Vienna, 1891 p. 19, quoted in Zahn's articles). The same authority declares that the covers and the pictures bound with this codex belong to the first half of the sixth century, and they seem very probably to be taken from one of these "old originals" (so Zahn, and Conybeare acknowledges it possible). If this is correct at least one exemplar of this codex is to be dated before 550 A.D. It is possible, however, as Conybeare has pointed out, to hold that these illustrations belonged to the Syriac exemplar from which the Armenian scribe translated the last twelve verses.

But if these words were in the exemplar, and especially if they are to be considered as of equal importance with the titles of the Gospels, why were they not copied at the first, instead of being crowded in as an afterthought?

5. But if the Armenians considered this a true and authentic tradition, why is this rubric never found in other Armenian MSS which contain these twelve verses translated as they are in the Edschmiadzin codex? A search in all the other codices found in the library at

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Edschmiadzin has disclosed no other instance, and it does not occur in any of the codices found in Venice, Paris, London, and Oxford.

6. Moreover if this tradition came from an ancient and authentic Syriac MS why has it not been found in some Syriac codex?

Zahn, who felt these latter difficulties, would resolve them by assuming that "a learned man of the fourth or fifth century, who was interested in the question of the origin of Mark xvi. 9—20, because he did not find the section in all copies, who also knew the work of Papias, and found in it a *Diegesis* of Aristion's, essentially the same with Mark xvi. 14—18, availing himself of his information, entered on the margin of his copy of the Gospels the words Ἀριστίωνος πρεσβυτέρου. This notice may then have gained currency over a small range and have made its way to Armenia among other places." (See Conybeare's Translation of Zahn's article, Expositor, Sept. 1894, p. 225.) While we do not accept this supposition of Zahn's, his theory is interesting for it suggests that the rubric may be founded ultimately upon the inference or supposition of some student or scribe, which we believe to have been probably the case.

To us, then, it seems probable that the rubric "Ariston Eritzou" was not contained in the text of the fifth century exemplar of this codex, and that quite possibly it was added from a much later source, which may have been based on a late tradition or supposition or a mistaken inference. Furthermore it does not seem to us that this rubric was intended to have the same dignity as the titles "Of Matthew" etc. affixed to the Gospels.

At the same time it is probable that these verses were translated into the Armenian as early as the fifth century, since Eznik, a fifth century Father of the Armenian Church cites vs, 17, 18 almost precisely as we have them in the present text, but seems to carefully abstain from quoting them as belonging to Mark. That these verses belonged to the early Armenian version but were afterwards excised, is declared by a late Greek Father, according to Conybeare who does not give his name. Was this Theodore Chrthenavor early in the eighth century, who declared that Luke 22 : 43, 44 was cut out from the early Armenian version by certain Docetic heretics? (See Conybeare, Expositor, Dec. 1895, p. 405.)

As far as internal evidence goes this is quite possible, since these verses as found in the Edschmiadzin codex agree fairly well with the rest of the Gospel. However they might have been translated at a later time in an archaic style, by a careful student of the version.

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Whether translated originally from the Greek or the Syriac has not been determined. Conybeare "on reconsideration" holds that they are from the Greek. Zahn inclines to a Syriac origin, which is quite possible, since we know that at the beginning of the fifth century they had a recognized place in the Syriac Bible as represented by the Peshitto.

But even granting, as we do not, that the phrase "Ariston Eritzou" represents an early and authentic tradition, we must insist that we do not know who the Ariston mentioned is.

Mr. T. A. Archer suggested that he is to be identified with the Aristion, who, with the Presbyter John, was an authority for Papias, as mentioned in Eusebius, Church History, III, 39. For this identification, which he adopted, Conybeare has argued strongly.

The difficulties this theory must face are:

1. The rubric speaks of Ariston, not Aristion. But Conybeare cites the Armenian version of Eusebius to show that the name of Aristion can be and is thus transliterated. Zahn and Resch agree, but Prof. Bacon declares Ariston does not represent Aristion "badly spelled, as was natural, by an Armenian scribe."

2. In the quotations from Papias he speaks of "Aristion and the Presbyter John," and though the two names are thrice repeated, the title presbyter is always given to John and never to Aristion. However in the Armenian version we have an instance where Aristion and John are together called presbyters.

3. Aristion, as far as our evidence goes, was not a writer, for Papias declares he had not been a reader of writings, but an ear-witness (αὐτήκοος) of Aristion and John and therefore received from him an oral tradition, not a written narrative.

4. Had Aristion been the author of the end of Mark it is most probable that he would have communicated this fact to Papias, and that Papias would have mentioned it in his discussion of the origin of the Gospel according to Mark.

5. Eusebius notes that Papias, in his διηγήσεις has a story of Justus called Barsabas "how he drank off a deadly drug, and yet suffered no ill effects because of the grace of the Lord." This is of course a proof of the fulfilment of Mk. 16: 18, and Dean Burgon has argued from it that Papias here refers to these verses, and that they were contained in Mark's Gospel in his day.

Now Eusebius does not in any way connect this story of Papias with Aristion or the Presbyter John, but Conybeare stated in his first article that:

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"In a 12th century Bodleian Codex of Rufinus' Latin version of the *Ecclesiastical History* this story is mentioned in the margin against the name of Aristion (in p. 136. 31), from which we may suppose that the scholiast of Rufinus regarded the story as in a peculiar manner due to or suggested by Aristion. . . . It is unlikely that Aristion himself in his διηγήσεις told the story in illustration of verse 18, of which he was the author, and that Papias only copied it from him. But the scholiast of Rufinus may have known that these twelve verses were Aristion's, and on that account have connected with Aristion's name a story so aptly illustrative of one of the verses in question." (Ex. Oct. 1893 pp. 246, 250.)

This seemed strong confirmation for the identification of the Ariston of the rubric with Aristion, the authority of Papias, to Conybeare, and also to Zahn, who, confining the narrative from Aristion in these twelve verses to vs. 14–18 held that Papias wrote down the narratives of Aristion, and that the Armenian title is due to the fact that Papias attributed this section of his narrative to Aristion, as was known by the person who compiled the longer ending. (Ex. Sept. 1894 p. 224.)

But this, the strongest support to the theory, has failed, since this scholion is "a very ragged and late bit of writing" (Conybeare) and the inference from it is a mistaken one, as is shown by Prof. J. Vernon Bartlet, who, requested by Prof. Bacon to transcribe this gloss in the Rufinus codex, "with special regard for its location on the page," sent him the following explanation, recently published (Bacon in The Journal of Biblical Literature, Vol. xxx, Part I, 1911, p. 105).

"My notes on the Bodleian MS. of Rufinus, which I examined (MSS. 2. and Miscell. 294, once in the monastery of Eberbach) are to this effect. The scholion is really simply one of a number of marginal notes, indicating the contents, which occur throughout the MS. Conybeare noticed that the 'scholion' 'Quod Justus qui et Barsabas venenum biberit nihilque ex hoc triste pertulerit' stood 'in the margin over against the name of Aristion' and inferred that this showed consciousness that this story was 'due to or suggested by Aristion.'

"But the position 'over against' Aristion is a mere accident, due to the fact that there is *no room* on the inner margin of the Ms. (which is written in 2 columns), where it should come, for the marginal note to be inserted. Hence it comes opposite the name of Aristion, which though a good deal earlier in the text, is in fact parallel (to the matter in question) in the other column. There are similar cases which I have observed elsewhere. Thus the inference was a mistake of Conybeare's, and the observation is of no historical value."

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Concerning the identification of "Ariston Eritzou" with the Aristion known through Papias, we can at least say that it is not proven.

But already before the publication of his first article Prof. Sanday had suggested to Dr. Conybeare that the Ariston referred to was Ariston (or Aristo) of Pella, whom Eusebius quotes at some length as reporting the overthrow by Hadrian in 135 A.D. of Jerusalem. In a scholion of the seventh century by Maximus Confessor (De mystica Theol. cap. i, p. 17, ed. Corderii) he is declared to be the author of the Jewish-Christian "Dialogue of Jason and Papiscus. Prof. Bacon has argued that this statement is late and untrustworthy, and that the above writing was originally anonymous.

Resch declares that "If we take the name Ἀρίστων in the strict form in which it has been transmitted, no other person can be considered to be referred to thereby than *Ariston* of *Pella*. He acknowledges however that in antiquity there was a confusion of the names Ἀρίστων and Ἀριστίων. However it is interesting to note that the name of Ariston of Pella is transliterated in precisely this way in the Armenian version of Eusebius.

Conybeare brings against this identification two objections:

1. The date of 140—150 A.D. is too late for the origin of a section so uniformly found in Greek MSS Zahn agrees. But the testimony of Greek MSS is now seen to be not so uniform as was at first supposed, and the arguments of Resch and Rohrbach that these verses were added to Mark at the time of the formation of the fourfold Gospel canon, which would date them just about this time, as far as their connection with the second Gospel is concerned, is a sufficient answer to this objection.

2. "So far as we know anything about Ariston's writings they were not at all similar to these twelve verses." But in his second article Dr. Conybeare himself overthrows this argument by stating: "Both dialogue and history of Ariston having perished, we have no means of deciding whether the twelve verses are in the style of that author. We do hear that some people mistook his dialogue for a work of Luke the Evangelist; and as that was so, it is likely that Ariston of Pella could have written the twelve verses."

Moreover this objection would tell equally against the identification with the Aristion of Papias since we do not know anything about the *writings* of Aristion, and in fact do not know that he was a writer at all. Besides if the rubric here does refer these verses to Ariston of Pella, it by no means proves that he wrote them. It may indicate only a tradition, and as our previous arguments have sought to show, this

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tradition, since it cannot be proved that this rubric was contained in a fifth century exemplar of the codex, is not necessarily either ancient or authentic.

Zahn declared that:

> "Conybeare has quite rightly rejected the idea of Ariston of Pella. It is quite true that Moses of Chorene had plenty of fables to relate about him (II. 60), and we could not avoid thinking of him, if Langlois (Coll. of Arm. Hist., I. 391; II. 110, n. 3) were right in ascribing to Moses the statement that Ariston was secretary of the Bishop Mark, of Jerusalem, in the time of Hadrian.
>
> "If that were so, the completer of the Second Gospel must have been identified with the secretary of the Evangelist Mark, and also have received the name Ariston." (Conybeare's trans. Ex. Sept. 1894, p. 222.)

Zahn declares, however that Langlois is mistaken, and that Moses of Chorene means that Ariston was the secretary of Hadrian. Prof. Bacon states that Moses means that Ariston was the secretary of Ardaces. These three views prove sufficiently that at this point the testimony of Moses of Chorene is ambiguous.

If modern scholars find difficulty in interpreting this testimony it is quite possible that a scribe of the tenth century might find equal difficulty. If Langlois could suppose that Ariston was secretary of Bishop Mark of Jerusalem, according to Moses of Chorene, so might this scribe who would of course be familiar with the writings of this great Armenian historian. That the scribe should further confuse the Bishop Mark of Jerusalem, in the time of Hadrian with the Evangelist Mark is by no means impossible. That he did make these blunders, has been argued by Prof. Bacon, ("Against the Authorship of the Last Verses of Mark," The Expositor, VI Series 1905, pp. 401—412 and Hasting's Dictionary of Christ and the Gospels, Vol. I, "Aristo.")

To suppose that the Gospel according to Mark was finished by this secretary, is, as Prof. Bacon suggests, quite a natural inference. That this was the inference not of an ancient authority, but of the scribe who wrote this codex in 989 A.D. seems far more probable than the supposition that it is to be traced back to "a learned man of the fourth or fifth century," in view of the fact that we have as yet found no duplication of this rubric in any Armenian or Syriac MS. It is quite possible that its omission from Armenian MSS of later date than our codex is due to a recognition either of its late date, or of its precarious foundation, or both.

It is but just to say that the author's doubts concerning the anti-

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quity and trustworthiness of this ascription of the last twelve verses of Mark to "Ariston" arose while studying the original articles of Dr. Conybeare, and it was not until later that the articles of Prof. Bacon were studied. These served to confirm the view already formed, but the preceding argument is by no means dependent upon the acceptance or rejection of Prof. Bacon's theory of the misunderstanding of the Armenian scribe. That theory suggests an explanation of the origin of the inference, but independently of it, the evidence indicates:

1. We have no evidence that this rubric contains an early tradition, since we cannot trace it back of the MS in which it is found, which is dated 989 A.D.

2. We have no proof that it is a trustworthy tradition, since no other trace of it has as yet been found.

3. We cannot be sure which Ariston the rubric refers to. The evidence for his identification with the Aristion of Papias is very weak. And if the scribe intended to indicate Ariston of Pella, the probability is that he was mistaken.

Therefore we conclude that the words "Ariston Eritzou" of the Edschmiadzin codex gives only a late, and probably an untrustworthy inference or conjecture of a scribe.

The whole question, therefore, of the authorship and source of the last twelve verses of the Gospel according to Mark is still open

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The original announcement of the discovery.
HARNACK, In the Theologische Literaturzeitung, Nov. 1893.
Little more than a recapitulation of the above. Inclines to the view that Conybeare is right.

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ZAHN, In the Theologische Literaturblatt, Leipzig, for Dec. 22 ? 1893. Translation by Conybeare in the Expositor, Sept. 1894, pp. 220–226.

Argues the compiler of 16 : 9–20 took vs. 14–18 from Papias who had derived them from Aristion. The rubric to be traced to "a learned man of the fourth or fifth century."

RESCH, ALFRED, Ausser-Canonische Paralleltexte zu den Evangelien, T. und U. x Band, Heft 3, p. 449. Translation by Conybeare in the Expositor, Sept. 1894, pp. 226–232.

The rubric refers to Ariston of Pella, redactor of the oldest Gospel canon who is its author.

Ariston of Pella is here indicated as the author of these verses, and he must therefore have been the redactor of the earliest Gospel canon.

CONYBEARE, "On the Last Twelve Verses of St. Mark's Gospel. The Expositor, Dec. 1895, pp. 401–421. (Series V, No. xii.)

A reply.

BACON, B. W., "Against the Authorship of the Last Verses of Mark." The Expositor, Dec. 1905, pp. 401–412. (Series VI, Vol. XII.)

The scribe meant Ariston of Pella, thinking he was the secretary of the Evangelist Mark. A late and mistaken tradition.

BACON, "Aristo." Hasting's Dictionary of Christ and the Gospels in loco.

A further discussion of the above theory.

BACON, B. W., Journal of Biblical Literature, Vol. XXX, Pt. I, 1911, pp. 105–107.

Contains the note by Prof. Bartlett concerning the mistaken inference from the gloss in the codex of Rufinus.

THE EGYPTIAN VERSIONS

Egypt is of great significance in the history of the New Testament as the home of the non-Western text. In importance therefore the Egyptian Versions of the South rank next to the Syriac versions of the East and the Latin versions of the West. The history of the conclusions of Mark must now be traced, as far as possible, in the versions of Egypt.

The present classification of the dialects of Egypt divides them into Bohairic (Memphitic), the dialect of the district about Alexandria; the Middle Egyptian, which includes the Memphitic, Fayyumic, Akhmimic, etc.; and the Sahidic (Thebaic), the dialect of Upper Egypt.

The Bohairic, originally spoken in the district about Alexandria, was the most literary of the dialects of Egypt, and ultimately superseded them all. This version then became, what it still remains, the official version of the Coptic Church throughout the country. The

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origin of the Bohairic Version must therefore be associated with Alexandria.

But Greek was the early official language of this part of Egypt, and the earliest extant writings of Egyptian Christianity are in that tongue. It would therefore be antecedently probable that Upper Egypt, which we know formerly reacted against foreigners, would first require a version in the vernacular. Critical study supports this inference, concluding that the Sahidic Version was most probably the earliest Egyptian version, followed by the Middle Egyptian and the Bohairic in the order named.

The date of the earliest Egyptian version is generally given as the latter part of the second or the early half of the third century. The year 200 A.D. cannot be very far wrong (Kenyon) since the Sahidic shows in the N.T. a type of text which prevailed in the second century and in the O.T. a pre-Origenian text.

The Greek text from which the Sahidic was translated belonged to the type represented by ℵB, although it contained a considerable "Western" element of an early character, perhaps the type shown in Clement of Alexandria. The translation is idiomatic, and in some cases inexact.

The Middle Egyptian Version is known to have been profoundly influenced by the Sahidic, but is not yet available for critical use.

The Bohairic, the latest of these versions, shows a desire for more literal exactness in translation, and also exhibits the influence of what was considered, at the time it was made, a better Greek text. Where it differs from the Sahidic it almost always follows "Alexandrian" readings.

The Sahidic Version.

The Sahidic Version agrees with the Bohairic in its "Neutral" tendencies and in its freedom from "Antiochian" interpolations, which do not seem to have influenced the text of Egypt until the tenth century. It is to be placed among such representatives of the ancient text as ℵ, B, Claromontanus, Irenaeus, and Clement of Alexandria. Its lack of readings peculiar to L, with the exception of the double ending of Mark, show that it does not belong to the late Alexandrian type of text.

Most of the Coptic manuscripts known have been supplied by the White Monastery, from which, according to the estimate of Dr. Crum, nine thousand leaves have been obtained.

The Sahidic Gospels have been edited from many fragments by G. Horner in "The Coptic Version of the New Testament in the

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Southern Dialect, otherwise called Sahidic and Thebaic. Oxford, Clarendon Press, 1911. In regard to his sources the editor says:

> "Two general observations may be made in regard to the whole body of fragments. The first is the freedom from corrections and the consistency of the orthography of individual MSS. . . . Only one MS appears to have been extensively corrected. The second observation is the unanimity of the readings. Variants appear, as is only natural in so large a number of MSS of different dates, but the variants are few, and their scarcity may be connected with the fact that so many of the fragments have come from the same place, the White Monastery."

We are able to call attention to a MS in this version containing the double ending of Mark which has not, so far as we are aware, been included in any previous discussion of our problem. This is a fragment brought from Egypt by M. Weill in 1905, who seems to have obtained it in Cairo. A few leaves of the same MS were obtained by Sayce, and one leaf is in the Bodleian.

Folio 162b of this Sahidic MS (Weill 16 which Horner calls 108 in his edition) contains the Shorter Conclusion, followed by the customary note, and the Longer Conclusion. It is interesting to note that preceding Luke, in this MS, is found an imperfect list of tituli of his Gospel, reminding us in this respect of L. The MS is dated by Horner in the eleventh century and he translates the text as follows:

> And when they had heard they came out of the sepulchre, and they ran, for trembling was laying hold on them, and a confusion; and they said not a word to anyone, for they were fearing. But all the things which were ordered them, to those who followed Petros they said openly. After these (things) also again Jesus was manifested to them from the place of rising of the sun unto the place of setting. He sent through them the preaching which is holy and incorruptible of (the) eternal salvation.
>
> But these (lit. those) also belong to them:
>
> But a trembling was laying hold on them and a confusion; and they said not any word to any one, for they were fearing. But when he had risen in (the) morning of the first day (lit. day 1) of the week, he was manifested first to Maria the Magd(alen)e this (one) out of whom he cast seven *demons*. That (woman) went, she showed to those who had been (lit. were) with him, as they mourn and (weep). They also (again), when they had heard that he is living and that she saw him, were unbelieving. But after these (things) to two of them, as they walk, he was manifested in another *form*, as they go into the (field). (But) after these (things) to the (twelve he was

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manifested) and he reproached their unbelief and their hardness of heart, because they *believed* not those who saw him having risen. And said he to (them), Go into all the *world* and preach the *gospel* to all the creation. He who will *believe* and be *baptized* will be saved; he who will not *believe* will be condemned. But these signs will follow those who will *believe*: they will cast demons out in my name; they will speak in languages; and they will take up serpents in their hands; *even* if they should drink a deadly potion it will not hurt them; they will place their hands upon those who are sick, and they (will) recover (lit. rest). But the Lord Jesus after his speaking to them was taken up to the heaven, he sat (on the) right of God. (But they, when they had (come out), preached (everywhere), the) Lord helping them, confirming the word (through) the signs which follow them.

According to Markos, it is finished.

Horner says that the curved brackets mean that the fragment is imperfect in the verse.

The testimony of this recently discovered Sahidic fragment containing the double ending of Mark is of far greater weight and significance than would at first sight appear. Since as yet but a mere handful of Sahidic fragments containing the closing verses of Mark is known,—Horner seems to cite only 50, the Bodleian fragment and 102, together with the Greek of Paris 129,—that one of them should possess the double ending is surprising. It may indicate not a peculiar, but a relatively common form of the Gospel in this version. As has been noted, Horner declares that there is great unanimity of reading in the fragments found. It certainly indicates far more than would be implied by the discovery of an additional Greek MSS of this form, and we believe approximates in significance, though not of course in importance, to the discovery of the Sinaitic Syriac, so far as its bearing upon the version to which it belongs is concerned.[1]

While the MS containing the double ending is assigned to the eleventh century, it seems quite probable that an earlier archetype had a form of the text in which the Gospel ended with the Shorter Conclusion; which may have been early introduced into this version and obtained wide currency, for aught we know.

This supposition receives a slight confirmation from the Arabic gloss which accompanies the insertion of the Shorter Ending in Brit.

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[1] It is known that there is a Coptic (probably Sahidic) MS with a double ending among the recently acquired J. Pierpont Morgan MSS.

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Mus. Or. 1315 of the Bohairic Version which reads "In the copy of the Sa'îd." This note refers to the Sahidic copy declares Horner (Sahidic, p. 636).

The Sahidic, as we have seen, is older than the Bohairic, the latter, though not entirely independent of it, being based on a later Greek text. The fact that one MS of the Sahidic contains the double ending in the text while the two Bohairic MSS which contain the Shorter Conclusion relegate it to the margin, confirms our theory of the history of the conclusions of Mark as developed in Egypt. The Sahidic represents our third, the Bohairic our fourth stage. At the same time there are also indications, as Zahn has shown, that some Bohairic MS contained the Shorter Ending only. That the Egyptian versions should mirror the text dominant in Alexandria at various periods is what would be antecedently expected, and what the evidence seems to show.

The Bohairic Version.

The Bohairic Version, still in ecclesiastical use among the Copts, is probably to be dated toward the close of the third or in some part of the fourth century (so Kenyon, Lake, etc.). It originated almost certainly in Alexandria, and shows an underlying Alexandrian text (Hyvernat quoting Headlam, and so also Nestle).

Present critics consider the underlying Greek text "singularly pure and free from so-called 'Western' additions." It belongs to the type of text represented by ℵB and L.

Our earliest codices of this version belong to the twelfth century, though certain fragments may be as early as the ninth century. The Bohairic is often accompanied by an Arabic translation, though a Graeco-Bohairic MS has not as yet been discovered.

This version has been edited by G. Horner in "The Coptic Version of the New Testament in the Northern Dialect, otherwise called Memphitic or Bohairic, with Introduction, Critical Apparatus, and literal English Translation," Oxford, Clarendon Press, 1898. Horner declares that in all the MSS examined by him the customary type of the Gospel according to Mark was found, with no reference to the Shorter Ending save in Hunt 17, (Horner's A) and Brit. Mus. Or. 1315 (Horner's E).

The testimony of Hunt 17, "a very fine and important MS" (Lightfoot) is given by Horner (p. 480) as follows:

> "At the end of v. 8, in the break, as if referring to the last twelve verses, is a gloss [in Arabic] 'this is the chapter expelled in the Greek.'

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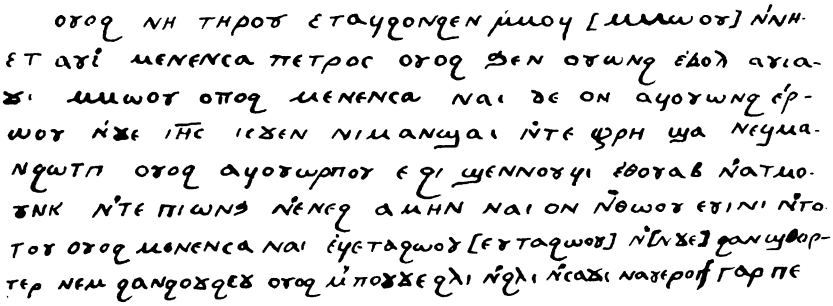

Bohairic. Hunt 17, margin.

Copied from Abbé Martin's Introduction à la Critique textuelle du Nouveau Testament, Partie pratique, II, p. 399.

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"In the margin is written by the ordinary early corrector 'And all the (things) which he ordered to them who came after Peter, (lit. and) openly they spake of them. And after these (things) indeed, again Jesus appeared to them from the risings of (the) sun until his settings, and he sent them to preach (lit. throw) (the) good tidings, holy, imperishable, of the eternal life. Amen. These (words) themselves are belonging to those: (viz) And after these (things) troubles and perplexities seized them: and they said not a word to anybody, for they were fearing.'"

This MS was written, as it testifies, in 1173–4 "by Theod(orus of) Pûseri (Bûsir), monk of the Laura of S. Makari (Macarius)" a monastery still existing in the Nitrian desert, southwest of Cairo, whence it was brought by Robert Curzon in 1838. It is now in the Bodleian Library at Oxford.

"The importance of this MS," to quote Lightfoot, "consists in a great measure in its marginal additions, which are very frequent. The text seems to give the original Bohairic Version in a very pure form; while the margin supplies all, or very nearly all the passages which in fewer or greater numbers have crept into the text of other Bohairic MSS, and which (as far as regards the Bohairic Version itself) must be regarded as interpolations, whatever sanctions they may have in Greek MSS or other ancient authorities." (Scrivener's Introduction, II, p. 111.)

We see then that it forms a close parallel to the Harclean Syriac, through it seems to have had a different ancestry (cf. Burkitt, Encycl. Bibl. iv, col. 5010).

Notice that in this MS the Shorter Ending is not preceded by any note, but is concluded by the Amen; that the text is confused; that the usual note follows with a repetition of the latter part of v. 8. in the strange form, "And after these things troubles and perplexities seized them: and they said not a word to anybody, for they were fearing."

Zahn declares that this usual note and the supplement to the Shorter Ending found in this MS has nothing to do with the Longer Ending, but is a modification of v. 8b, and that the marginal gloss must have originated from a MS in which the Shorter Ending with the Amen formed the proper ending of the Gospel, and yet it was remarked that certain other MSS read the quoted supplement to the Shorter Ending besides this.

Now this last MS gives evidence of a bold attempt to conform the text of the Shorter Ending and v. 8; dealing with the matter in a manner parallel to k where, as we shall see v. 8 has been modified

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to read, "Now they, when they came out from the tomb fled, for fright and terror held them on account of their fear."

Hunt. 17 therefore witnesses to the fact that there once existed Bohairic MSS of two types, both ending apparently with the Shorter Conclusion, but one type simply adding the shorter ending to v. 8 without modification, and the other modifying v. 8 so that it would not contradict the Shorter Ending, perhaps, as Zahn suggests, by inserting this ending between the earlier and later portions of v. 8

The other Bohairic MS which contains the Shorter Conclusion in the margin is British Museum Oriental 1315, again a Coptic-Arabic MS whose date is 1207 A.D. This MS is "profusely glossed in Arabic" and in the text follows D, Copt. Arab. Rom. Vat. 9 (Greg. 30) except in the early chapters of Luke. Horner's presentation of the testimony of this MS which he calls E in his discussion of the text, is as follows:

> "After v. 8, is the break which marks the end of verses in all MSS, and in it a sign corresponding to the two similar signs in the margin, which seem to indicate an omitted section: then in the lower margin is written by the original hand:
>
> 'In another writing: and all things which they ordered Peter, he did them quickly (συντόμως): and after these (things) Jesus manifested himself to them: from the risings of (the) sun until his settings; by them he sent the preaching, holy, unpolluted, for (lit. in) eternal salvation.'
>
> "This section is translated thus [in Arabic]:
>
> 'And all things which he ordered to Peter, they did them decidedly (decisively); and after this Jesus appeared to them from the risings of the sun to her settings, and by their means he sent the Gospel, pure (holy), without pollution.'
>
> "There is also a gloss [in Arabic]:
> 'in the copy of the Sa'îd' which belongs to the translation."

This gloss, according to Horner's edition of the Sahidic (p. 636) refers to the Sahidic copy.

Horner holds that "unpolluted" and "salvation" show that the form of his latter MS is more correct than that found in Hunt. 17, and that the absence of the confused addition of the latter, which he considers a version of the gloss of L indicates that it goes back to an earlier and more intelligent copyist. The readings of Or. 1315 seem to associate it more closely with the Greek, with k, and with the Syriac, while the closest ally of Hunt. 17 seems to be the Ethiopic, which

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we must next discuss. Note that a reference to the rising and setting of the sun occurs also in the "ab oriente ad occasum' of the paraphrase of the Pistis Sophia.

Egyptian Versions, Bibliography.

For general discussions see Lightfoot and Headlam in Scrivener, K. Lake in Encycl. Brit. under "Bible", Kenyon in his "Handbook to the Textual Criticism of the N. T.", Burkitt, in Encycl. Bib. "Texts and Versions," and Robinson in Hasting's D.B. "Egyptian Versions."

For lists of MSS containing portions of the Coptic Bible see Hyvernat, Revue Biblique, Internationale, 1896, No. 4, p. 54ff. and 1897 No. 1, pp. 55–62, cf. also 48f.

The best full collections are said to be in Woide, Appendix ad editionem N. T. Graeci, Oxford, 1799 and Amelineau, ZAS 1886–1888 with Crum's Coptic MSS brought from Fayyum.

The Bohairic Version has been edited by G. Horner, "The Coptic Version of the New Testament in the Northern Dialect, otherwise called Memphitic or Bohairic, with Introduction, Critical Apparatus, and literal English Translation, Vol. I, Introd. Mt. Mk. Oxford, 1898.

Compare also Sanday, Appendices to the New Testament, p. 187 and Hyvernat, Revue Biblique Internationale, 1897, No. 1, p. 48f.

The Sahidic Version has recently been edited (by G. Horner apparently) in "The Coptic Version of the New Testament in the Southern Dialect, otherwise called the Sahidic and Thebaic, Oxford, 1911.

The Ethiopic Version

The Ethiopic Version is the name commonly given to the version in Ge'ez, the classical language of the Abyssinians.

The tradition of the Abyssinian Church states that this version was made from the Greek before the fifth century. Dillmann accepts this tradition as correct for the following reasons: (Charles, H.D.B. in loco).

1. Christianity was firmly established in Abyssinia by the fifth century.

2. Jared, poet and musician, issued a hymnal for that church in the sixth century.

3. Chrysostom appears to have known an Ethiopic Version of the Bible.

4. Only in the first period did the Ethiopic Church translate directly

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from the Greek, for after the appearance of the Arabic language in Egypt translations were made from that tongue.

Others date the version in the fifth or sixth century (Guidi, Burkitt, Charles, Kenyon) and Guildemeister puts it in the sixth or seventh century.

Now whether Christianity teached Abyssinia through Egypt, its northern neighbor, or directly from Palestine by teachers voyaging down the Red Sea, we are not told, but there are traces of an older Ethiopic Version of the Gospels made from the Syriac, as was the Aramaic (cf. notes by Guildemeister pointing out the Aramaic coloring of the Ethiopic N.T. in Tischendorf's N.T. III, p. 895 note). The text of the Ethiopic now and then does agree with the Old Syriac against almost all other authorities. Hackspill would assign the version to the fifth century, and holds it was made from a Syrian Occidental text.

Later, perhaps in the fourteenth century, the text was revised from the medieval Arabic text current at that time in Alexandria, as was proved by Guidi (La Traduzione degli Evangelii in Arabo in Ethiopico, Rome, 1888). Hackspill declares (Zeit. für Assyrologie, xi, 117, 1897) that only the oldest MS furnishes us with a comparatively pure text, all others representing the later revised text. The unrevised text is represented by Co. Paris Aeth. 32 while most MSS and all printed editions present us with a text which is influenced by the Alexandrian vulgate and shows traces of the Arabic. Most of the MSS, of which at least one hundred are contained in European libraries, belong to the XVII, XVIII, and XIX centuries.

As to the text represented by the version, Charles (H.D.B. I. p. 792) says that it is related to the older type as represented by ℵB but shows Western, Alexandrian, and Syriac elements. As yet no critical edition of the Ethiopic has been published, and our knowledge of the version is too slight to use to any considerable extent. It is therefore impossible to give a full presentation of the testimony of the Ethiopic as regards the last verses of Mark but it seems to present most of the forms we have hitherto discussed.

Sanday (Appendices ad Novum Testamentum) speaking of twelve MSS found in the British Museum declares that three omit the ending, viz. Or. 509 (xviii); Or. 513 (xvii) and Cod. Add. 16,190 (undated by Sanday and Gregory).

Seven MSS (Cod. Or. 510 (1664–5), 511 (xvii), 512 (xvii), 514 (xvii), 516 (xvii), 517 (xvii), 518 (1655) close the Gospel with the Shorter Ending which he thus translates:

"et omne quod imperavit Petro et iis qui ejus erant perfecte narravit. et posthac apparuit iis dominus Jesus ab ortu solis ad occasum et

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misit eos praedicatum evangelium sacrum incorruptibile ad salutem aeternam. Amen. Amen."

A study of Sanday's list leads to the inference that the only manuscript of the twelve which can contain the Longer Conclusion is Cod. Or. 507 (xv).

However WH (II, Notes p. 38) states that the Shorter Conclusion is found "in at least several Aethiopic MSS continuously with v. 8, and followed continuously by vv. 9–20, without note or mark of any kind (Dr. Wright)". Although we have consulted Wm. Wright's "Catalogue of the Ethiopic MSS in the British Museum acquired since the year 1847" London, 1877 we have found no further light on the subject, nor reference to this fact.

The Ethiopic Version therefore furnishes us with further evidence for a form of the Gospel ending at v. 8, agreeing thus with ℵ, B and Ss with all of which, as we have seen it has textual affinity.

Certain MSS conclude the Gospel with the Shorter Ending alone. There is nothing to forbid, and much to suggest that the Shorter Ending was introduced into the text from Egypt. We have noted that all the MSS are late, belonging to the seventeenth century, and that they represent a revision of the text which seems to be dependent on Alexandrian authorities.

It also witnesses to the later text,—of which we have found illustrations in four Greek uncials and one cursive, as well as in the Sahidic,—the text with the double ending. It therefore confirms the conclusions derived from earlier evidence.

If, as we hold, the Shorter Ending originated in Egypt, it would be quite natural to find it in the Ethiopic Version, which might be conformed, from period to period, to the current standard Alexandrian text. This, as far as our evidence goes, is precisely what occurred. It should be noted that the one MS cited by Sanday for the Longer Conclusion, if our interpretation of his evidence is correct, antedates by two centuries the MSS containing the Shorter Conclusion. This however may be due to the form of text followed at this late date. Of the influence of the Sahidic and the Bohairic Versions on the Ethiopic our evidence does not give us sufficient information to draw conclusions.

Ethiopic Version, Bibliography.

For general discussions see the authorities quoted under Egyptian Versions, to which may be added Charles on "Ethiopic Versions" in Hastings D.B. Vol. I, pp. 791–793.

For lists of MSS see Wm. Wright, Catalogue of the Ethiopic MSS

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in the British Museum acquired since the year 1847, London, 1877 (?) and Zotenberg, Cat. des MSS Ethiopiens de la Bibliothèque Nationale, 1877, p. 141ff. together with Sanday, Appendices ad Novum Testamentum.

No critical edition of the Ethiopic Version has as yet been published, and therefore it is impossible to obtain the full testimony of this version upon the matter we are discussing.

Arabic 13

An Arabic MS, Rom. Vat. Arab. 13 (formerly 71), is included by Tischendorf and Tregelles as a witness for the form of the Gospel which ends at v. 8. WH do not contain any mention of it in their notes.

Abbe Martin, after examining the MS, declares that it cannot be considered a witness against the last twelve verses, that at most it can only be cited as doubtful, and that the probability is that it contained the Longer Conclusion. The following is practically a condensed translation of his argument.

The MS contains portions of the first three Gospels and two epistles, in a good text. It is written in a Cufic character and belongs to the eighth or ninth century, though many of its lost folios have been supplied at a comparatively recent time.

The last line of folio 74 originally did not end with the last words of 16 : 8 but with "they were." The end of the verse must therefore have been written on folio 75 which has disappeared. But if this folio was to contain only the concluding words of v. 8 would not the scribe have found means, by a little crowding, of writing them on the verso of folio 74? Would he have wished to take a whole folio of parchment for two or three words? Anyone who has had any experience in the study of manuscripts knows that this would not be the case.

It is true that today one reads under this original last line the words $\overset{\frown}{\varepsilon}\overline{\text{T}}$ after "they were afraid" but these words were supplied by a secondary hand, and therefore prove that v. 8 was finished on the recto of folio 75.

Folio 75 is on a different parchment, and in a different hand, not Cufic but Neskhi in character, proving that a folio of the original MS has disappeared at this point. This has happened in this manuscript

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in many parts of the N.T. and it is therefore probable that here also the folio of the original has perished and been replaced at a relatively late date.

The same hand which wrote at the bottom of folio 74 verso "they were afraid" added the sign $\widehat{\text{ε}}$ which represents the Greek τέλος but it is the same hand which adapted this MS to liturgical uses, as is proved by the words σάββατον and κυριακή in the margin, and the same sign is written in a number of places in the Gospel. This sign, which the second hand has sketched after Mark 16 : 8, explains how those who superficially inspected this Arabic MS could have deceived themselves as to its character and significance, and have thought that it signified not the end of a lection but the end of the Gospel itself.

To these considerations it should be added that this MS discards the readings of the family of MSS which reject 16 : 9—20.

We find, therefore, that Arabic 13 is in reality of no significance in discussing this question, but it has been examined lest we seem to overlook some of the testimony.

This discussion of Abbe Martin's is found in his Introduction à la Critique textuelle du Nouveau Testament, Partie pratique, Tome II, pp. 430ff.

The Shorter Conclusion

The Old Latin Version

The Witness of the Old Latin Codex Bobiensis (k).

Summary.

k contains the shorter ending only, following v. 8 without note or break. V. 8 has been slightly altered to conform to it.

Text .... That of Cyprian at Carthage in the middle of the third century.

Place .... Roman North Africa.

Time..... Fifth century.

Inference . The earliest O.L. text probably ended with v. 8, agreeing with ℵB and Ss. The shorter ending was introduced into it from Alexandria, either directly or through upper Egypt.

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Fol. 41

ecce locus illius ubi fuit positus·
7 Sed ite et dicite discipulis· et petro
praecedo uos in galileam illic me
uidebitis· sicut uobis dixi [8]illae au
tem c̈um̈ cum exirent a monumē
to fugerunt· tenebat enim illas
tremor· et pauor· propter timorē
9 Omnia autem quaecumque prae
cepta erant et qui cum puero erant
breuiter exposuerunt posthaec
et ipse hī[s] adparuit et ab orientē
usque· usque in orientem· misit
per illos· sanctam· et incorruptam· ha·
salutis aeternae· amen·
praedicationis.

Fol. 41b.

EUANGELIUM· CATA·

MARCUM· EXP·

INCIP· CATA MATTHEUM

FELICITER

Notes by Dr. Sanday in O.L. Bibl. Texts. p. 23.

illae m. p., illi m. 2. Prius cum expunctum est a m. 2 ? 9. Confer codicem graecum Parisinum L et App. I. p. 115. et ab orientē MS; et om. Fleck. Dehique ha indicat uerbum subter scriptum praedicationis : -dicationis est in rasura. Quod prius fuit uidetur in n desisse. Debebat esse sanctam et incorruptam praedicationem salutis aeternae.

Fol. 41b. Lineae secunda et tertia rubricatae sunt et ornamenta partim rubro colore insignita.

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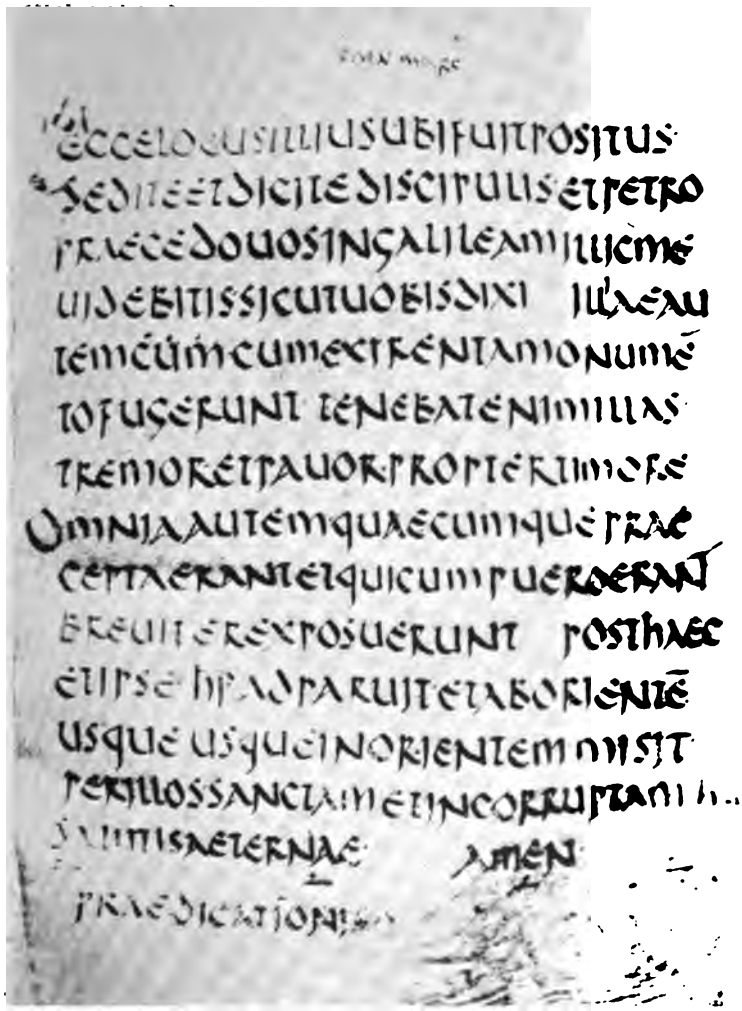

Codex Bobiensis (K).
From Old Latin Biblical Texts, No. II edited by Wordsworth and Sanday.

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Discussion.

In the Bobbio MS now numbered G. vii. 15 in the National Library at Turin, usually called Codex Bobiensis (k) we have the only instance as yet discovered of a Greek or Latin MS which contains the shorter ending alone without the longer.

But k is a codex of unusual interest and importance; "perhaps the most important of the Old Latin MSS" (Nestle). "It is a book of the highest interest, being undoubtedly the oldest existing representative of the African version of the Gospels, and as such is historically and critically inferior to none of our Old Latin Biblical texts." (Wordsworth, Old Latin Biblical Texts No. II, p. v.)

What then was the origin, the source, and the relations of the Old Latin version represented by k?

In the past it has been pretty generally acknowledged that the birthplace of the Old Latin version was to be found in Roman North Africa. Recently some have dissented from this view, but at any rate the oldest O.L. MSS seem to come from that region and to be connected with the Fathers there.

The 'African' text, as Dr. Hort called it, of the O.L. is represented in the Gospels by k and e, in the Acts and the Apocalypse by h. Dr. Hort was the first to call attention to the fact that a large proportion of these two texts of the Gospels are "absolutely identical with that of Cyprian where he differs from European MSS and Fathers; but each has also an admixture of other readings." (WH II, p. 81.)

As to the source of this version it is possible to suppose that it came to North Africa from Rome or from Alexandria. Upon this problem an examination of the text will throw some light, but at present we recall the words of Kennedy in H.D.B. "The Old Latin Version" p. 56.

> "Perhaps the translation came there by way of Rome, whose connection with Africa and Carthage at this time was as intimate as can be conceived. Perhaps it traveled westward through upper Egypt. Indeed certain phenomena bearing upon the underlying Greek text seem to favor this hypothesis, notably a remarkable affinity here and there in the O.L. with the recension of Hesychius, and in both O.T. and N.T. with Cod. Alex."

In a note Kennedy suggests that "perhaps this affinity is better explained by later revisions."

As to the Codex Bobiensis itself, it once contained the four Gospels, probably in the order John, Luke, Mark, Matthew (so Wordsworth). At present we possess, roughly speaking, only Mk. vii—xvi and Mt. i—xv.

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The handwriting is angular rather than round, without ornament or flourish, and in spite of the fact that it is written with great neatness in "a very firm and practical hand like that of a professional scribe" (Wordsworth) it contains many scribal blunders, some of them extraordinary in character. A mere glance at the last folio of Mark will illustrate this fact. To account for these two seemingly contradictory facts the most probable hypotheses seems to be that the writer was a Greek scribe with very little knowledge of Latin. This would lead us to suspect an Alexandrian scribe, as Tischendorf has already done.

> "As to the Greek affinities of the book besides the CATA of the headlines, the blunders that meet us on nearly every page prove to us that F, R, and S were unfamiliar letters to our scribe, and his occasional substitution of P for R is probably a Graecism. In view of circumstances like this Tischendorf hazards the same conjecture as he had previously made in regard to the cognate MS., the Palatine Gospels (e, Vienna no. 1185), that it was written in Africa by an Alexandrian calligraph, who was wholly ignorant of Latin (Wiener Jahrbücher, cxx. Anz. Blatt., p. 45, 1845, cp. Evangelium Palatinum Prolegomena, p. xix., Lipsiae 1847.)"
>
> Wordsworth in O.L. Bibl. Texts. No. II. p. xv.

Certainly any scribe who could write "abrode aps te exredist tibi ut sicreat" could not have been much of a Latin scholar.

The text of k, however, is a pure one, in spite of the many blunders of the scribe. Sanday, after a most careful critical examination concludes: "Corruption in the sense of transmitted and aggravated blunders of the scribe it has suffered from severely enough, but the intrusive element derived from foreign texts is, so far as we have seen, comparatively small." (O.L. Bibl. Texts II, p. lxxxiv.)

The MS is to be dated in the V century (Tischendorf, Wordsworth) though Swete says IV or V and Fleck, the early editor says VI or perhaps V.

As for the type of Greek text underlying k, Sanday, after a careful examination, finds that two elements stand out with great clearness, the Western and the Neutral. "Each of these enters in large proportion into k; the 'Western' is naturally somewhat the larger, but the 'Neutral' is also strongly pronounced." (O.L. Bibl. Texts, II, p. 116.)

As to the readings which k has in common with the Old Latin, Sanday concludes that they "present all the characteristics of 'Western' readings in general." "Few of these can lay a claim to the text as it was originally written."

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As to the readings which k has in common with ℵB he says that they "must have come in at a remote stage before the Greek and Latin texts in the ancestors of k were separated, in fact either before the Western text branched off at all or soon after the point of parting."

Back of k Sanday infers a still older form of the version, "a form not much dissimilar from k, but with some features of greater antiquity." (p. xc.)

> "The common archetype of k and Cyprian is, if not quite, yet very nearly the most primitive form that we can trace. Every step that we take toward recovering it seems to widen the gap which separates it from the other stem or stems, including a, b, and d." (p. lxvii.)

We conclude, therefore, that the 'African Latin' as represented by k, differs from other forms of the Old Latin version not only in its language, but also in its underlying Greek text. Such 'Western' elements as it shares specifically with the O.L. seem to have come in relatively late.

This Greek text differs noticeably from the eclectic texts of the fourth century both Greek and Latin.

> "For the most part the interpolations of this, the oldest continuous Latin text of the Gospels that has some down to us are to a large extent not the interpolations of the eclectic text and its omissions are not their omissions; moreover its renderings are not the renderings of the later revised Latin texts such as the Vulgate and its immediate predecessors. All this tends to show that the Latin text of the third century had to a large extent escaped revision from Greek sources; in other words that the Greek text implied by k and its companions is that which underlies the original translations."
>
> Burkitt, Encyl. Bibl.

It has considerable affinity with the early Alexandrian text as represented by ℵB and agrees with it in omitting the longer conclusion.

It also has affinities with the Old Syriac as represented by Ss in its tendency toward abridgment, in its significant omission of a clause in Mt. 1 : 25, and again in its omission of the longer ending. In spite of the fragmentary character of the witness of k and of Sc, which omits all of Mark save the last few verses, Baethgen (Evangelienfragmente p. 80) finds that it has special affinities with Sc., as does e the only other representative of 'African Latin' in the Gospels.

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The text of e, however, which shows later development than k and a greater divergence from Cyprian, does not, unfortunately, contain Mark xvi. It is therefore not possible to conclude with any degree of certainly whether the shorter conclusion was a recognized portion of the text, and found in the text of Cyprian as read at Carthage in the middle of the third century, before the Decian persecution.

The affinity of k with L is very slight. This peculiarity of k in containing the shorter ending alone, without hint of any other ending for the Gospel, is the more remarkable since the longer ending seems to have early become an integral part of the text of the Gospel as known at Rome.

It seems most natural to conclude, in view of the text we have found underlying k, that it received the shorter ending from Egypt, and this receives a measure of confirmation from the fact that, as Zahn has shown, an ancestor of the Bohairic Codex, Hunt. 17 which contains the shorter ending in the margin "must have dealt with the matter in essentially the same manner."

This assertion of Zahn that there must have been Bohairic MSS which resembled k in text adds further support to our contention that the shorter ending was introduced into the 'African Latin' not from Rome, but from Egypt, possibly through Upper Egypt, as Kennedy suggests, either through or with the support of Coptic MSS; possibly from Lower Egypt, as Hunt 17 would suggest, with the support of the Bohairic version; possibly from some Greek MS of Alexandria.

It would seem, then, probable that the earliest 'African Latin' text did not contain either ending, but concluded the Gospel at v. 8, as do ℵB, and Ss, with all of which we have found k to have affinity. So WH.

That the shorter ending was not introduced into the version first by the Alexandrian(?) scribe of k, but was copied by him from an earlier exemplar is quite evident, not only from the general characteristics of the scribe but from the impossibility of the original translator writing in v. 9 "puero" for "petro" which he had just copied in v. 7 correctly, and bungling the phrase "from the east even unto the west" until he writes "ab orientē usque· usque in orientem." If an Alexandrian, however, he would most probably be familiar with the shorter ending.

How long before the transcribing of k in the fifth century the shorter ending was introduced into the Latin it is of course impossible to say. And yet there seems no evidence to forbid our believing that

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it was in the text of Cyprian, which would carry us back two centuries earlier. Either at the time it became a part of this text or later v. 8 was modified to conform to the shorter conclusion, omitting the words in v. 8b which contradict it, "they said nothing to any one."

Codex Bobiensis, therefore, furnishes us with another witness to the antiquity and to the diffusion of the shorter ending, and lends weight to the conclusion that the shorter ending originated in Egypt.

Bibliography.

k is edited by Worsworth and Sanday in Old Latin Biblical Texts No. II, 1886.
A facsimile of Mk. 16 : 6–9 forms the frontispiece.
In this volume the text is printed in full, is described by Wordsworth and its relations discussed by Sanday.

BURKITT, Encyl. Bibl. "Texts and Versions" Vol. IV.

KENNEDY, H. G. A., H.D.B., "The Old Latin Versions" Vol. III.

The relation of k to Sc is discussed in Baethgen's Evangelienfragmente, p. 80.

Compare also the usual authorities: Tischendorf, Zahn, Scrivener, von Soden, etc.

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GREEK MSS WITH BOTH CONCLUSIONS

Codex Regius (L).

ΜΗ ΕΚΘΑΜΒΕΙΣΘΑΙ	ΦΕΡΕΤΕ ΠΟΥ
ΙΝ ΖΗΤΕΙΤΕ ΤΟΝ	ΚΑΙ ΤΑΥΤΑ
ΝΑΖΩΡΑΙΩΝ ΤΟ̄	
ΕΣΤΑΥΡΩΜΕΝΟΝ	ΠΑΝΤΑ ΔΕ ΤΑ ΠΑΡΗ
ΗΓΕΡΘΗ ΟΥΚ ΕΣΤῙ	ΓΓΕΛΜΕΝΑ ΤΟΙΣ
ΩΔΕ ΙΔΕ Ο ΤΟΠΟΣ	ΠΕΡΙ ΤΟΝ ΠΕΤΡΟΝ
ΟΠΟΥ ΕΘΗΚΑΝ ΑΥ	ΣΥΝΤΟΜΩΣ ΕΞΗ
ΤΟΝ ΑΛΛΑ ΥΠΑΓΕ	ΓΓΙΛΑΝ ΜΕΤΑ
ΤΕ ΕΙΠΑΤΕ ΤΟΙΣ ΜΑ	ΔΕ ΤΑΥΤΑ ΚΑΙ ΑΥΤΟΣ
ΘΗΤΑΙΣ ΑΥΤΟΥ ΚΑΙ	Ο ΙΣ ΑΠΟ ΑΝΑΤΟΛΗΣ
ΤΩ ΠΕΤΡΩ ΟΤΙ	ΚΑΙ ΑΧΡΙ ΔΥΣΕΩΣ
ΠΡΟΑΓΕΙ ΥΜΑΣ ΕΙΣ	ΕΞΑΠΕΣΤΙΛΕΝ ΔΙ
ΤΗΝ ΓΑΛΙΛΑΙΑΝ	ΑΥΤΩΝ ΤΟ ΙΕΡΟΝ
ΕΚΕΙ ΑΥΤΟΝ ΟΨΕΣ	ΚΑΙ ΑΦΘΑΡΤΟΝ ΚΗ
ΘΕ ΚΑΘΩΣ ΕΙΠΕ ̄	ΡΥΓΜΑ ΤΗΣ ΑΙΩ
ΥΜΙΝ	ΝΙΟΥ ΣΩΤΗΡΙΑΣ
ΣΛΓ̄ ΚΑΙ ΕΞΕΛΘΟΥΣΑΙ Ε	— — — — — — —
Β̄ ΦΥΓΟΝ ΑΠΟ ΤΟΥ	ΕΣΤΗΝ ΔΕ ΚΑΙ
ΜΝΗΜΕΙΟΥ ΕΙ	ΤΑΥΤΑ ΦΕΡΟ
ΧΕΝ ΔΕ ΑΥΤΑΣ ΤΡΟ	ΜΕΝΑ ΜΕΤΑ ΤΟ
ΜΟΣ ΚΑΙ ΕΚΣΤΑΣΕΙΣ	ΕΦΟΒΟΥΝΤΟ
ΚΑΙ ΟΥΔΕΝΙ ΟΥΔΕΝ	ΓΑΡ
ΕΙΠΟΝ ΕΦΟΒΟΥΝ	— — — — — —
ΤΟ ΓΑΡ	ΑΝΑΣΤΑΣ ΔΕ ΠΡΩΙ
	ΠΡΩΤΗ ΣΑΒΒΑΤΟΥ

Folio 113, recto (Tischendorf).

Codex Regius (L).

Summary.

The Codex Regius, L, = Paris, Nat. Gk. 62 (Sd. e 56) contains the Shorter followed by the Longer Conclusion, both preceded by notes.

Text .... Resembles B, the citations of Origen, and the margin of Syr. Harc.

Place .... Egypt.

Date .... VIII C.

Inferences Upon a text ending at v. 8 has been later imposed the Shorter Ending and later still the Longer Ending. All this seems to have occurred in Egypt.

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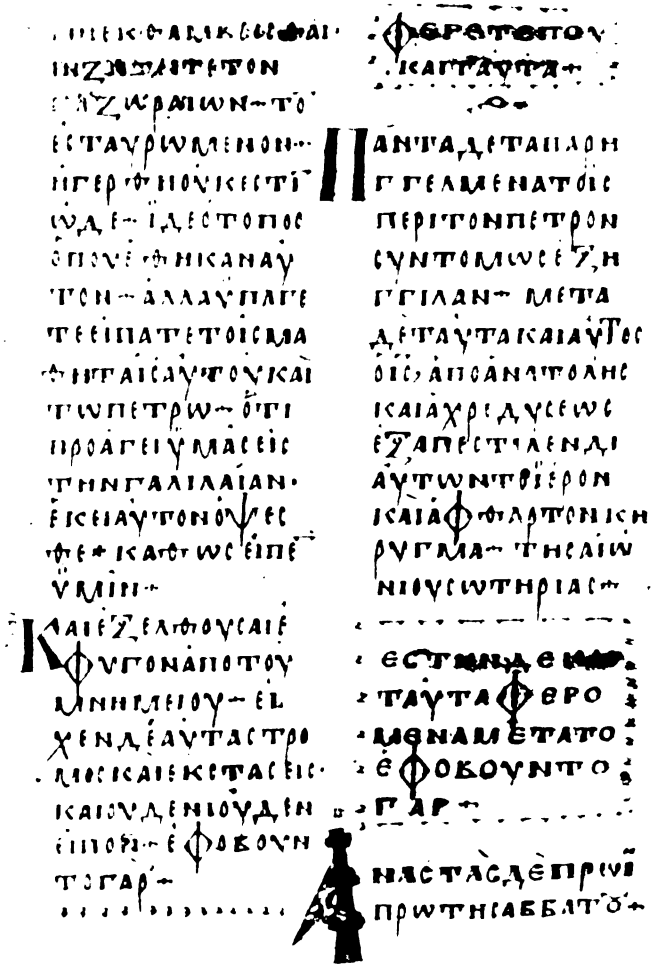

Codex Regius (L).
From Kenyon's Handbook to the Textual Criticism of the New Testament.

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Discussion.

In L verse 8 ends with το γαρ on the last line but one of the first column of folio 113 recto. The last line of the same column is filled up by ornamental marks, which is this scribe's method of indicating the end of a Gospel, and therefore indicated here that in some sense the Gospel according to Mark is held to end at this point.

At the beginning of the second column, enclosed in ornamental marks, is written ΦΕΡΕΤΕ ΠΟΥ ΚΑΙ ΤΑΥΤΑ "These also are in a manner (or "somewhere" i. e. in some authorities) current." The next line contains a small ornament and then follows the Shorter Ending. This is immediately followed by another note, surrounded, as before, with ornamental lines ΕΣΤΙΝ ΔΕ ΚΑΙ ΤΑΥΤΑ ΦΕΡΟΜΕΝΑ ΜΕΤΑ ΤΟ ΕΦΟΒΟΥΝΤΟ ΓΑΡ "And there are these also current after ἐφοβοῦντο γάρ." The Longer Conclusion follows, beginning with a large and ornate uncial A (compare Cursive 22), the first two lines of which completes the recto of folio 113, and the remainder of which fills both columns of the verso, the first column of Folio 114 and the first line of the second column, which reads ΩΝ *ΑΜΗΝ* followed immediately by the usual colophon εὐαγγέλιον κατὰ Μάρκον surrounded, as were the preceding notes, with ornamental lines, more elaborate in character however than the preceding (not the case in the colophon of Luke, the last verses of Matthew and Mark are lost). This is followed immediately by the chapter headings of Luke's Gospel.

This codex has always been of peculiar interest, not only because up to 1884 it was the only known Greek codex to contain the double ending of Mark, and therefore naturally evoked the scorn of Burgon, who declared that the scribe was "evidently incapable of distinguishing the grossest fabrication from the genuine text," but because of the character of the text itself, which has given it a high standing with textual critics from the times of Stephens and Beza. "By far the most remarkable document of its age and class" (Scrivener) it contains many important critical notes either in the margin or the text, which appear to be by the first hand. Of these we have just had examples. Tischendorf declares that many readings found in the margin of the later Syriac editions seem to be found in this codex only.

The manuscript is written in a curious hand in compressed uncials. It is poorly written, showing many ignorant blunders, and may have been copied by a scribe who did not understand Greek.

Nevertheless the text is "extraordinarily good" (Gregory) and it seems to have been copied from a MS of the same type of text as B, with which it often agrees, though at the date when this MS was produced, another type of text had become dominant in the church.

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It is also very remarkable in that it agrees with the citations of Origen, and with the margin of the Harclean Syriac. It further possesses affiliations with C and among the versions it is an ally of the Bohairic. Beyond other MSS of its date it abounds in "Alexandrian forms."

The type of writing shows it cannot be dated earlier than the eighth century, to which it is generally assigned.

At to its place of origin, that is pretty generally supposed to be Egypt, but since this point is so important for our future discussion we quote from Tischendorf, who edited it:

> "Ac patriam quidem Aegyptum vel Aegypti viciniam fuisse hominemque qui scriberet certe non ipso genere Graecum, verisimillimum est. Quae sententia maxime commendatur quum iis de quibus supra exposui rationibus orthographicis, tum crebris Alexandrinae dialecti vestigiis, tum mira errorum scribendi atque interpungendi frequentia tum denique inepta quae identidem occurrit diversarum lectionum confusione. Neque certe contra hanc sententiam est quod foll. 24. et 25., ut jam retuli, in diebus festis et Sancti Saba et Sancti Clementis martyris mentio fit."
>
> Mon. Sacra Ined. 1846 p. 21.

As to the punctuation used in this MS, Tischendorf says:

"Plerumque major distinctio fit crucis signo, minor puncto; sedetiam commata et semicola quae vocant, atque insuper aliquoties puncta bis, ter, quater posita occurrunt." At this point in the discussion we anticipate by calling attention to the fact that in L the sign for the end of a sentence or major division immediately precedes as well as follows ἐφοβοῦντο γάρ and though, as can be plainly seem, this sign of the cross is used to separate clauses, yet this MS rather supports our contention that in the original these two words formed not the end of the preceding sentence, but the beginning of a new sentence, which was abruptly broken off when the authentic conclusion of the Gospel according to Mark disappeared.

The Codex Bobiensis, therefore, bears witness:

1. To an early period when Mark ended at v. 8 as in B, with whose text L has affiliations which are close.

2. To a later time when the Shorter Ending was appended, and continued for some time to be the only ending of Mark.

3. To a still later period when the Shorter Ending was still preferred, though the Longer Conclusion had gained such recognition as to compel its addition.

(Later still, as cursive 274 shows, the Longer Conclusion became the only authentic ending of Mark and the Shorter Conclusion was relegated to the margin.)

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4. Egypt is indicated by L as the region where this occurred. With Egypt L is associated by its form of writing; its style of text, similar to that of B, of the citations of Origen, and of the Harclean Syriac, margin; its "Alexandrian forms;" and the fact that it is an ally of the Bohairic Version.

This MS. is another witness to Egypt as the home of the Shorter Conclusion.

Frag. Sinaiticum (ד[12]).

Folio 3, Verso.

ιδε ο τοπος οΙΙΟΥ	ΤΑΥΤΑ ΚΑΙ ΑΥΤΟΣ
εθηκαν αυΤΟΝ	ΙΣ ΑΠΟ ΑΝΑΤΟΛΗΣ
αλλα υπαγεΤΕ ΕΙΠΑ	ΑΧΡΙ ΔΥΣΕΩΣ ΕΞΑ
τε τοις μαθΗΤΑΙΣ ΑΥ	ΠΕΣΤΕΙΛΕΝ ΔΙΑ ΑΥ
του και τΩ ΠΕΤΡΩ	ΤΩΝ ΤΟ ΙΕΡΟΝ ΚΑΙ
οτι προαγΕΙ ΥΜΑΣ	ΑΦΘΑΡΤΟΝ ΚΗΡΥ
εις την γαΛΙΛΑΙΑΝ	ΓΜΑ ΤΗΣ ΑΙΩΝΙΟΥ
εκει αυτοΝ ΟΨΕΣΘΕ	ΣΩΤΗΡΙΑΣ ΑΜΗΝ
καθως ειΠΕΝ ΥΜΙ·	ΕΣΤΙΝ ΔΕ ΚΑΙ ΤΑΥΤΑ*
και εξελθοΥΣΑΙ ΕΦΥ	ΦΕΡΟΜΕΝΑ ΜΕΤΑ
γον απο τΟΥ ΜΝΗ	ΤΟ ΕΦΟΒΟΥΝΤΟ ΓΑΡ
μειου ειχεΝ ΓΑΡ ΑΥ	ΑΝΑΣΤΑΣ ΔΕ ΠΡΩΙ
τας τρομοΣ ΚΑΙ ΕΚ	ΠΡΩΤΗ ΣΑΒΒΑΤΟΥ
στασις και ΟΥΔΕΝ	ΕΦΑΝΗ ΠΡΩΤΟΝ
ι ουδεν ειΠΟΝ ΕΦΟ	ΜΑΡΙΑ ΤΗ ΜΑΓΔΑ
βουντο γΑΡ[illegible]	ΛΗΝΗ ΠΑΡ ΗΣ
[illegible]	ΕΚΒΕΒΛΗΚΕΙ ΕΠΤΑ
[illegible]	ΔΑΙΜΟΝΙΑ ΕΚΕΙΝΗ
ευαγγεΛΙΟΝ	ΠΟΡΕΥΘ[illegible]ΑΠΗΓ
κατα μαΡΚΟΝ	ΓΕΙΛΕΝ[illegible]ΜΕ

Mark xvi. 6—fin.

* These three lines are in a smaller character.

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Codex ℸ[12].

Fragm. ℸ[12] = Gregory 0112 (Sd ε 46).

Summary.

Contains the double ending of Mark.
Text .... Resembles B and L.
Date .... VII C.
Place .... Egypt.
Inferences The Gospel was known in three forms, the short Gospel, the Short Ending, and the Long Ending. This knowledge is to be traced to Egypt.

Discussion.

As regards the contents and arrangement of the endings there is a close resemblance between Codex ℸ[12] which contains both, and L. Notice that v. 8 is followed by the customary subscription εὐαγγέλιον κατὰ Μάρκον showing that it was ultimately descended from an archetype which ended here, —as do B ℵ and Ss, —to which the subscription was appended. In L the subscription is wanting but the end of the Gospel at this point is indicated by ornamental marks in the last line of the column.

2. The note in smaller characters preceding the Longer Conclusion ΕΣΤΙΝ ΔΕ ΚΑΙ ΤΑΥΤΑ ΦΕΡΟΜΕΝΑ ΜΕΤΑ ΤΟ ΕΦΟΒΟΥΝΤΟ ΓΑΡ is identical with the note in L but is not surrounded by ornamental lines.

3. Burkitt points out that as the column in the MS consists of twenty-five lines, five lines are wanting before ταῦτα καὶ αὐτός and he restores these lines as follows:

ΠΑΝΤΑ ΔΕ ΤΑ ΠΑ
ΡΗΓΓΕΛΜΕΝΑ ΤΟΙΣ
ΠΕΡΙ ΤΟΝ ΠΕΤΡΟΝ
ΣΥΝΤΟΜΩΣ ΕΞΗΓ
ΓΕΙΛΑΝ ΜΕΤΑ ΔΕ

He also suggests that, as the note before the Longer Ending, which is common to this MS and L, is here written in smaller characters, it is quite possible that the note found in L before the Shorter Ending ΦΕΡΕΤΕ ΠΟΥ ΚΑΙ ΤΑΥΤΑ may have stood before his reconstruction. Swete inserts this reconstruction in his presentation of his evidence.

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Prof. J. Rendel Harris, on his first visit to the convent of St. Catherine on Mount Sinai discovered, amid a mass of fragments and loose leaves, three leaves, two of them stuck together, containing an ancient text of the latter part of Mark. This he published in 1890 in his Biblical Fragments from Mount Sinai, pp. xii, xiii, 45–52.

Upon a second visit in the spring of 1893 by holding up the compacted leaves of thin vellum in the strong sunlight he was able to read most of the closing words of Mark, and found a text containing both the Shorter and Longer Endings which he published in 1893 in the Journal of Biblical Literature (xii, Pt. II, p. 96). It is also published by Mrs. Lewis in her Catalogue of Syriac MSS on Mt. Sinai, (p. 103f.).

The text is closely allied to that of certain of the great uncials. When first discovered Harris thought it comparable to ℵ but Hort considered that it had closer affiliations with L, a surmise which the later discovery of the double ending confirmed.

As to the handwriting it is "a looped uncial with strong Coptic characteristics, not unlike that of the famous Codex Marchalianus of the prophets."

On account of its resemblance to this MS, and because of other signs of antiquity, Harris assigned it to the seventh century.

From the style of handwriting and the place of discovery the discover assigns to the MS an Egyptian origin.

The inferences to be drawn from this MS are the same as those we deduced from L.

Codex Athous Laurae (Ψ).

Mark 16:8.

ΕΦΟΒΟΥΝΤΟ ΓΑΡ: $\overset{\varepsilon}{\underset{\tau}{\wedge}}$
ΠΑΝΤΑ ΔΕ ΤΑ ΠΑΡΗΓΓΕΛΜΕΝΑ ΤΟΙΣ ΠΕΡΙ ΤΟΝ
ΠΕΤΡΟΝ ΣΥΝΤΟΜΩΣ. ΕΞΗΓΓΕΙΛΑΝ: ΜΕΤΑ
ΔΕ ΤΑΥΤΑ ΚΑΙ ΑΥΤΟΣ $\overline{\text{ΙΣ}}$ ΕΦΑΝΗ ΑΠΟ ΑΝΑΤΟΛΗΣ
ΚΑΙ ΜΕΧΡΙ ΔΥΣΕΩΣ ΕΞΑΠΕΣΤΕΙΛΕΝ ΔΙ ΑΥΤΩΝ
ΤΟ ΙΕΡΟΝ ΚΑΙ ΑΦΘΑΡΤΟΝ ΚΗΡΥΓΜΑ ΤΗΣ ΑΙΩ
ΝΙΟΥ ΣΩΤΗΡΙΑΣ ΑΜΗΝ:

ΕΣΤΙΝ ΚΑΙ ΤΑΥΤΑ ΦΕΡΟΜΕΝΑ
ΜΕΤΑ ΤΟ ΕΦΟΒΟΥΝΤΟ ΓΑΡ.

ΑΝΑΣΤΑΣ ΔΕ κ. τ. λ. to end of verse 20.
ΕΥΑΓΓΕΛΙΟΝ ΚΑΤΑ ΜΑΡΚΟΝ:

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Codex Ψ.

Codex Ψ [045] = 172 or B 52 in Laura Catalogue (Sd δ6)

Summary.

In Codex Ψ the double ending is found, but while the Longer Ending is preceded by the customary note, this MS is peculiar in that the Shorter Ending follows V. 8 without note or break.

Text .... Pre-Syrian, basis Alexandrian, with a number of early Western readings.

Date .... VIII or IX C.

Place .... Egypt.

Inferences As in the case of L and ℸ[12]; but here the testimony for a form of text appending the Shorter Conclusion directly to v. 8 is stronger.

Discussion.

In Codex Ψ the ἐφοβοῦντο γάρ is followed on the same line by an abbreviated τέλος which is evidently liturgical. On the next line follows the Shorter Ending without note or break, in which particular this MS differs from the other uncials of its class but agrees with 579. It is concluded by the Amen. The archetype from which this MS was descended probably had the shorter ending only.

The Longer Ending is preceded by the customary note ΕΣΤΙΝ ΚΑΙ ΤΑΥΤΑ ΦΕΡΟΜΕΝΑ ΜΕΤΑ ΤΟ ΕΦΟΒΟΥΝΤΟ ΓΑΡ as in L and ℸ[12] here written in shorter lines. It is followed by the usual subscription.

As to special readings, this MS is peculiar in having μέχρι for ἀχρί, agrees with ℸ[12] in omitting ὁ before Ἰησοῦς, and with k in omitting αὐτοῖς before ἐφάνη.

From the absence of the note which in the companion uncials accompanies the Shorter Conclusion, Gregory infers that this MS shows an earlier form of the text, unless a revision is implied by such forms as ἐφάνη, μέχρι, and ἀμήν.

This manuscript was found by Prof. Gregory on August 26, 1896 among fragments discovered in the monastery at Athos, Laura of St. Athanasius. By von Soden it is numbered δ6 and thus follows B ℵ C A D. He declares "Dieser Codex ist sehr korrekt geschrieben." (p. 943.) Gregory described it technically (Prolegomena, p. 445) but in July 1899 it was photographed by K. Lake whose notes (Journal of Theological Studies, Vol. I, 1900, pp. 290–292) furnish us with the best discussion of the character of the text. He concludes that the text of Mark is far more valuable than that of Luke and John (Mt. and Mk. 1 : 1–9 : 4 is wanting). His notes therefore refer only to the Markan text, and from them we gain the following facts.

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As to distinctively Syrian readings, none are certain as two variants claiming to be Syrian may well be Alexandrian. With this von Soden agrees who says there seems in this MS no Syrian influence. nor influence of Origen or Chrysostom.

As to purely "Neutral" readings, there seem a considerable number, probably about as many "non-Alexandrian Neutral" as "non-Neutral Alexandrian." It is remarkable that this codex agrees with B boh. in the readings connected with the cock-crowing in chapter xiv, and in omitting καὶ προσκολληθήσεται τῇ γυναικὶ αὐτοῦ in Mark 10:7, thus agreeing with ℵ B, 48ev. go.

The combination of this MS with Ss against all other Greek MSS and the Latins occurs five times (10:39; 11:21: 11:27; 13:11; 15:26).

The conclusion of Lake has such a direct bearing upon our discussion that we give it in full.

"We may therefore say with some confidence that in Mark Ψ gives us a pre-Syrian text of which the basis is Alexandrian (in the widest sense), while a number of the readings are Western. The interesting question is how did these Western readings get into an Alexandrian MS? On this point it may be observed that the Western element is not a late one, for the majority of the Western readings found in Ψ are among those which are rejected by the late texts. It is an early ancestor of Ψ who has left us the Western readings. This makes us think of the Biblical text of Clement, and raises the suspicion that it may not be necessary to go outside Alexandria in tracing the ancestry of Ψ. Certainly Cyril and Origen give us adequate evidence for the use of Alexandrian and Neutral types of text. Can we go on to say that the early Western element in the ℵCLΔΨ group is to be used as evidence for the early pre-Origenistic Western text of Alexandria, of which the quotations in Clement prove the existence but do not define the limits." (p. 290.)

It is possible that the text of this MS shows the influence of the Sahidic Version, but the points of contact are few, and could be explained by other suppositions.

This MS, with 579, witnesses to a form of text in which the Shorter Conclusion formed the only and the authentic ending of the Gospel. It further connects, as before, this Shorter Conclusion with Egypt.

Since this MS with L and ℸ[12] possesses a formula before the Longer Ending identical in all three MSS they are probably descended from an early common ancestor.

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T[1] folio 162 verso.

. . . . . ΩΔΕ· ΙΔΕ
Ο ΤΟΠΟΣ ΟΠΟΥ
ΕΘΗΚΑΝ ΑΥΤΟΝ
ΑΛΛΑ ΥΠΑΓΕΤΕ
ΕΙΠΑΤΕ ΤΟΙΣ ΜΑ
ΘΗΤΑΙΣ ΑΥΤΟΥ
ΚΑΙ ΤΩ ΠΕΤΡΩ
ΟΤΙ ΠΡΟΑΓΕΙ Υ
ΜΑΣ ΕΙΣ ΤΗΝ ΓΑ
ΛΙΛΑΙΑΝ· ΕΚΕΙ
ΑΥΤΟΝ ΟΨΕΣΘΕ
ΚΑΘΩΣ ΕΙΠΕΝ
ΥΜΙΝ· ΚΑΙ ΑΚΟΥ
ΣΑΝΤΕΣ ΕΞΗΛΘΟΝ
ΑΠΟ ΤΟΥ ΜΝΗ
ΜΙΟΥ ΚΑΙ ΕΦΥ
ΓΟΝ ΕΙΧΕΝ
ΓΑΡ ΑΥΤΑΣ ΤΡΟ
ΜΟΣ ΚΑΙ ΕΚΣ
ΤΑΣΙΣ ΚΑΙ ΟΥΔΕΝΙ
ΟΥΔΕΝ ΕΙΠΟΝ
ΕΦΟΒΟΥΝΤΟ
ΓΑΡ·
* * * * *
* * * * * *

* * * * *
* * * * *
[Π]ΑΝΤΑ ΔΕ ΤΑ Π[α]
ΡΗΓΓΕΛΜΕΝ[α]
ΤΟΙΣ ΠΕΡΙ ΤΟΝ

[πε]ΤΡΟΝ ΣΥΝ
ΤΟΜΩΣ ΕΞΗΓ
ΓΕΙΛΑΝ·
ΜΕΤΑ ΔΕ ΤΑΥΤΑ
ΚΑΙ ΑΥΤΟΣ Ο ΙΣ
ΕΦΑΝΗ ΑΥΤΟΙΣ
ΑΠ ΑΝΑΤΟΛΗΣ
ΗΛΙΟΥ ΚΑΙ ΑΧΡΙ
ΔΥΣΕΩΣ ΕΞΕΠΕ
ΣΤΕΙΛΕΝ ΔΙ ΑΥ
ΤΩΝ ΤΟ ΙΕΡΟΝ
ΚΑΙ ΑΦΘΑΡΤΟΝ
ΚΗΡΥΓΜΑ ΤΗΣ
ΑΙΩΝΙΟΥ ΣΩΤΗ
ΡΙΑΣ ΑΜΗΝ·
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ΕΙΧΕΝ ΓΑΡ ΑΥΤΑΣ
ΤΡΟΜΟΣ ΚΑΙ ΕΚ
ΣΤΑΣΙΣ ΚΑΙ ΟΥ
ΔΕΝΙ ΟΥΔΕΝ ΕΙ
ΠΟΝ ΕΦΟΒΟΥ
ΤΟ ΓΑΡ·
ΑΝΑΣΤΑΣ ΔΕ ΠΡΩΙ
ΠΡΩΤΗ ΣΑΒΒΑ
ΤΟΥ ΕΦΑΝΗ ΠΡΩ
ΤΟΝ ΜΑΡΙΑ ΤΗ
ΜΑΓΔΑΛΗΝΗ Α

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Fragment Parisiense (T^1).
Manuscrit copte 129 folio 162 verso.
From Amelineau's Notices et Extraits de la Bibliothèque Nationale, Bd. 34.
Phototype by Berthand, Paris.

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Fragment T¹.

Summary.

Fragment T¹ [099] = Paris. Nat. Copt. 129⁸ (℘ of Swete, Sd ε 47) contains the double conclusion, each ending having a note (now illegible) before it. In copying the Longer Conclusion the scribe begins with εἶχεν in v. 8.

Text .... Being only a single folio this cannot be determined.
Date .... VII or VIII C.
Place .... Egypt.
Inferences Witnesses to the threefold form of Mark in Egypt and shows the Longer struggling with the Shorter Conclusion.

Discussion.

Among the Coptic MSS from the great White Monastery, from which the Freer MSS are supposed to have come, were found several fragments of the New Testament, three of them Graeco-Sahidic, and six Greek only, but written in a hand of a Coptic character. These were published in 1895 by Amelineau with accompanying phototypes of some of the pages (Notices et Extraits de la Bibliothèque Nationale, Bd. 34, Paris 1895, pp. 363—424).

One of these fragments, a single folio called by him 129⁸ folio 162 contains the double ending of Mark. Of this he says:

> "Ce feuillet a conservé la fin de l'Evangile selon saint Marc, xvi, 6—18. Il contient donc un passage dont l'authenticité a été contestée; mais il ne le contient qu'après une longue remarque montrant que ce passage, qui va du verset 9 à la fin, n'était pas considéré comme absolument authentique par le copiste et celui qu'il copiait. Cette remarque se trouve en termes à peu près semblables en d'autres manuscrits; malheureusement, elle est complétement illisible en certains passages, par suite des préparations qu'il a fallu faire subir au parchemin avant de le faire entrer dans le volume dont il fait partie." (p. 370.)

Since the scribe begins to copy the Longer Ending not at Ἀναστὰς δὲ πρωὶ but with εἶχεν of v. 8, it is to be inferred that the Longer Ending was not contained in the exemplar of this MS, (or perhaps in an earlier archetype), but was added by the scribe from another MS, and that by an oversight he began to copy in v. 8, instead of at the beginning of v. 9, thus repeating a portion already transcribed.

Since the accompanying transcription incorporates the corrections of Gregory, who saw the MS in 1904, it differs somewhat from Swete.

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It is to be noted as to readings that T^1 has the article before Jesus with L while Ψ and $\urcorner^{12}$ omit it. It has ἐφάνη αὐτοῖς, and adds ἡλιοῦ with me codd (mg) aeth codd. It is unique in reading ἀπ' before ἀνατολῆς and in the reading ἐξεπέστειλεν. It does not however contain αὐταῖς for αὐτοῖς as can be seen by reference to the accompanying photograph. This was a mistake of Amelineau, followed by Swete but corrected by Gregory (Textkritik des N.T. p. 71).

It is to be noted, as explained by Amelineau "Ce feuillet a été placé à l'envers par le relieur ; le verso doit être au recto."

Since the fragment consists of one folio it is not possible to determine accurately the text relations, but since the other uncials showing the double ending are allied to ℵ B it seems probable that this MS is related to the same family.

The MS is dated in the seventh or eighth century, and the Coptic type of writing, and the signs used, as well as the place where it was found all make it certain that it was copied in Egypt.

The study of this MS confirms the conclusions drawn from a study of the other uncials containing the double ending, and we gain from it another glimpse of the struggle of the Longer with the Shorter Conclusion in Egypt.

The discussion of Amelineau should be supplemented by Gregory (Textkritik des N.T. pp. 70, 71, 1026, 1065, 1066).

Cursive 579.

Summary.

Paris, Bibl. Nat. Gr. 97 = Gregory 579, Scr. 743, Sd ε 376.

Testimony The only cursive with both endings in the text. Has τέλος in red at the close of v. 8 followed by Shorter Ending and Amen. On verso of the folio is the Longer Ending. No word of explanation before either ending.

Text .... In general like ℵ B. In Shorter Ending like L.

Place .... —

Date .... XIII C.

Inferences As late as XIII C the double ending persisted, with the shorter form first.

2. Some MSS appended the Shorter Ending without explanatory note.

3. The shorter form was appended to a type of text represented by ℵ B.

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Discussion.

In his interesting discussion of the Shorter Conclusion, Swete has presented in parallel columns the evidence of the four Greek uncials in which it is found preceding the Longer Conclusion. But he does not tell us that these uncials are supported by cursive 579 although Zahn had previously referred to the fact in his discussion (GK. II, p. 921).

This cursive resembles Ψ in having the word τέλος (in red) written in the text at the close of v. 8 followed immediately by the Shorter Ending with the Amen. This finishes the recto of folio 70. On the verso is found the Longer Ending. It is not accompanied by the final τέλος but neither is this found at the close of the other Gospels. No word of explanation accompanies either ending. But at the end of Mark is written, as regularly elsewhere at the close of the other Gospels, μνήσθητι κύριε τήν δούλην σου ὀλυμπίαν in red. Ψ contains a few explanatory words before the Longer Ending but none before the Shorter. In the latter respect, therefore, this manuscript agrees with it, but in text, as far as we can learn, it agrees completely with L.

This manuscript was discovered by Abbe Martin while preparing his technical description of the Greek MSS of the N.T. in the Bibliothèque Nationale. It had been listed in the Catalogus Codicum Manuscriptorum Bibliothecae Regiae, Tome II, published in 1743, as number 97, but most curiously overlooked by Griesbach, Scholtz, and even Tischendorf. It is to be classed with Gr. 96 (cursive 286) and Gr. 98 (cursive 287). The very enumeration here adopted shows its omission by early editors from the list of cursives. However it is mentioned in the lists of Scrivener, Gregory, Kenyon, and von Soder, usually with the note that it contains the double ending of Mark.

Before discovering it Abbe Martin had completed his elaborate discussion of the end of Mark contained in his Introduction à la Critique textuelle du N.T., Tome II, but found room to note and describe it in his preface (pp. iv—viii), and our discussion is little more than a translation and condensation of the material there presented. Martin gave to this cursive the number 743 which was followed by Scrivener, but Gregory calls it 579 and von Soden ε 376.

The MS is written on rather coarse parchment, and one or two folios are lacking at the end (John 20 : 28—end) as well as Mark 3 : 28—4 : 8. The first folios of Matthew have been slightly injured by dampness, but the titles are found at the beginning of the last three Gospels, and are also repeated at the top or bottom of each

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page. The Eusebian Sections are written in the margin, but rather irregularly. As to the text, it is disfigured by the boldest itacisms. There are a number of readings which are peculiar, or which link it with the oldest group of MSS. Martin places it in the same family with ℵ B. It does not contain Luke 22 : 42, 43 but includes John 5 : 3, 4 and the pericope adulterae with the title περὶ τῆς μϋχαλιδος (sic) γυναικὸς (f. 134b). The MS seems only partially adapted to liturgical use, the τέλος being found in the text, but seldom the ἀρχή, and there being no evidence of modifications at the beginning or end of the lessons. It was made, Martin thinks, for the use of some Melachite Christian.

The date assigned 579 is the thirteenth century.

This seems to be the only cursive known which contains the Shorter Conclusion in the text, as 274, the other cursive which contains it, relegates it to the margin. It is therefore the only cursive which seems to prefer this conclusion. Further it shows that this form of the Gospel persisted as late as the thirteenth century. While we must of course assume that it was either immediately or ultimately copied from an uncial of the L type, it is most interesting to note that even at this relatively late date the Shorter Conclusion had not become so entirely discredited as to forbid a scribe copying a text which contained it,—in other words as late as the thirteenth century a MS could contain the Shorter Ending and still be considered worthy of being used as an exemplar.

This cursive is also an additional witness to the fact that the Shorter Ending was appended to a type of text represented by ℵ B, and that there were MSS which appended it to v. 8 without explanatory note.

For further discussion of this cursive see Martin's "Description technique des manuscrits grecs du N.T."—Paris, Maisonneuve, 1884, pp. 91–94.

Cursive 274^{mg}.

Cursive 274 = Paris. Nat. Suppl. Gr. 79 (Sd. ε 1024).

This "peculiarly interesting and important" (Burgon) cursive of the tenth century is unique among Greek MSS in containing the Shorter Conclusion in the margin.

In the lower margin of folio 104 recto is found the Shorter Ending in the same form as in L save that ἀνατολῶν is written for ἀνατολῆς and the Amen is appended. (It seems to us quite possible that the Amen was added by a later hand, see the fascimile). The writing is in small capitals, unlike the cursive hand of the text, which Dean Burgon considered belonged to the transition period between uncial

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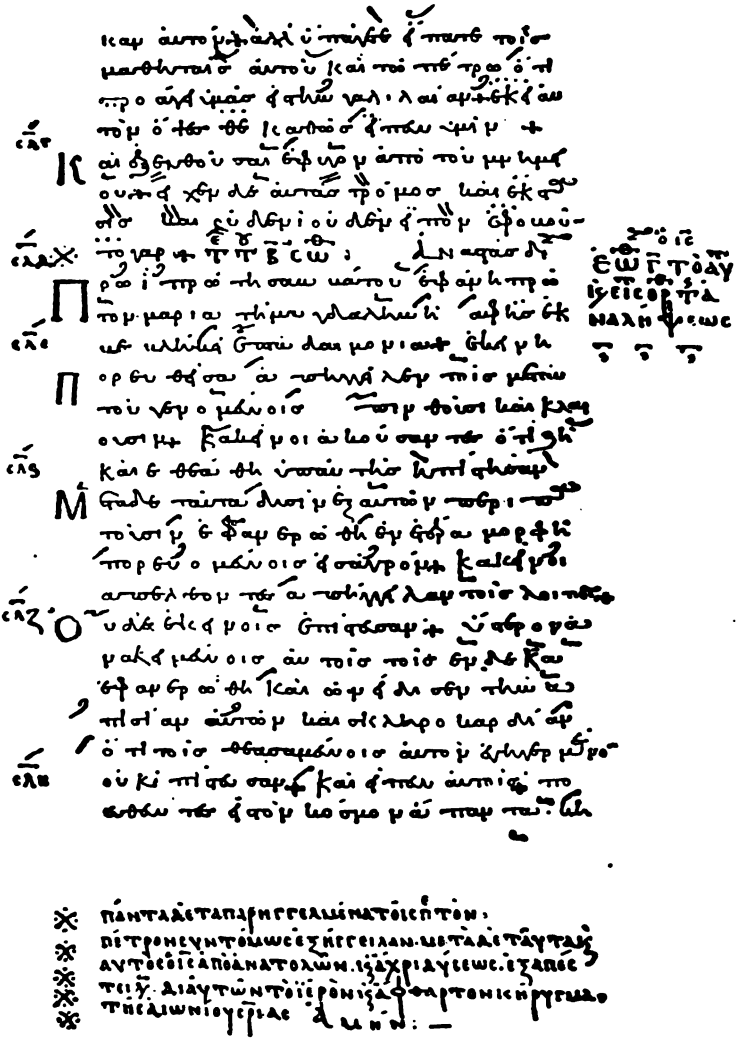

MINUSCULE Evv. 274 (Par. Nat. Suppl. Gr. 79) of the tenth century. Mark xvi. 6—15, exhibiting the shorter conclusion in the lower margin. From Nestle's Introduction to the Greek New Testament.

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and cursive writing. It occupies five lines, before each of which is found an asterisk in red. Burgon says the capitals themselves are in red, but this does not seem to be mentioned in Martin's discussion.

Opposite the last line of v. 8 of the text, in the outer margin, is found an asterisk, and at the end of the same line, next the inner margin, is found a sign. These are signs of reference, frequently found in this MS. Between verses 8 and 9 are written in uncials abbreviations indicating, "End of the second gospel of the Resurrection," and in the inner margin, opposite the beginning of v. 9 the signs which indicate "Third gospel of the Resurrection ; the same gospel at matins on Ascension Day." At the close of v. 20 in red is the usual final subscription

·⁘· Εὐαγγέλιον κατὰ Μάρκον ·⁘·

It is interesting to note that no formula or colophon of any kind accompanies the Shorter Ending in this MS.

This codex belongs to the tenth century. It is later therefore than L (VIII C) and earlier than 579 (XIII C).

As to the locality where the Gospel was produced, we have not found definite information, though von Soden tells us it once belonged to a Maximus Panagiota "Protokanonarchen von Gallipoli."

Cursive 274 witnesses to the fact that in the section where it was copied the Longer Conclusion was alone considered authentic, but the scribe added the Shorter Conclusion, which he evidently considered unauthentic but interesting, and which quite probably he copied from another MS (cf. Harclean Syriac), in the lower margin, inserting an asterisk opposite v. 8 to show where its connection with the text had been.

The Freer Logion

Jerome, in his dialogue between a Catholic Atticus and a heretic Critobulus, which he wrote at Bethlehem in 415 A.D., makes Atticus say:

"In quibusdam exemplaribus et maxime in Graecis codicibus, juxta Marcum in fine eius evangelii scribitur:

> Postea cum accubuissent undecim apparuit eis Iesus et exprobravit incredulitatem et duritiam cordis eorum, quia his qui viderant eum resurgentem non crediderunt. Et illi satisfaciebant dicentes: Saeculum istud iniquitatis et incredulitatis sub Satana[1]

[1] So cod. Vat. 1. The other MSS read "substantia".

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est, qui[1] sinit per immundos spiritus veram Dei apprehendi virtutem. Idcirco iam nunc revela iustitiam tuam."

Contra Pelag. II, 15.

Jerome does not tell us where he found these MSS and no such codex was known until the announcement in February 1908 that the saying had been discovered in one of the four MSS which Mr. Charles L. Freer of Detroit bought on December 19, 1906 from an Arab dealer, Ali Arabi in Gizeh near Cairo. The dealer declared the four MSS came from Akhmîm (ancient Panopolis) in Upper Egypt. These MSS contained parts of the Greek Bible of both the Old and New Testaments, written by different scribes, and ranged in date from the fourth or fifth to the eighth or ninth centuries.

It is with the third of these manuscripts, that containing the four Gospels, that we have to do in this discussion, since it is found to contain inserted in Mark 16 between the fourteenth and fifteenth verses not only the defence of the disciples, which Jerome had quoted, but also the answer of Jesus, which had previously been entirely unknown. To the saying of Jesus in this codex has been given the name of "the Freer Logion" though the manuscripts themselves, first called the "Detroit Manuscripts" and then the "Freer MSS," are, according to the recent volumes reproducing in facsimile the first and the third manuscripts, to be known as the "Washington Manuscripts" since they are to be ultimately placed in the Smithsonian Institute at Washington, D.C., a gift to the people of the U.S.

The text of the Freer Logion, with two slight corrections of scribal errors, reads as follows:

1 κἀκεῖνοι ἀπελογοῦντ(ο) λέγοντες ὅτι ὁ
2 αἰὼν οὗτος τῆς ἀνομίας καὶ τῆς ἀπιστίας
3 ὑπὸ τὸν Σατανᾶν ἐστιν ὃ μὴ ἐῶν τὰ ὑπὸ
4 τῶν πν(ευμ)άτων ἀκάθαρτα τὴν ἀλήθειαν
5 τοῦ θ(εο)ῦ καταλαβέσθαι δύναμιν διὰ
6 τοῦτο ἀποκάλυψον σοῦ τὴν δικαιοσύ
7 νην ἤδη ἐκεῖνοι ἔλεγον τῷ Χ(ριστ)ῷ καὶ ὁ
8 Χ(ριστό)ς ἐκείνοις προσέλεγεν ὅτι πεπλήρω
9 ται ὁ ὅρος τῶν ἐτῶν τῆς ἐξουσίας τοῦ
10 Σατανᾶ ἀλλὰ ἐγγίζει ἄλλα δ(ε)ινά καὶ ὑ
11 πὲρ ὧν ἐγὼ ἁμαρτησάντων παρεδόθην
12 εἰς θάνατον ἵνα ὑποστρέψωσιν εἰς τὴν
13 ἀλήθειαν καὶ μηκέτι ἁμαρτήσωσιν

[1] quae in MSS.

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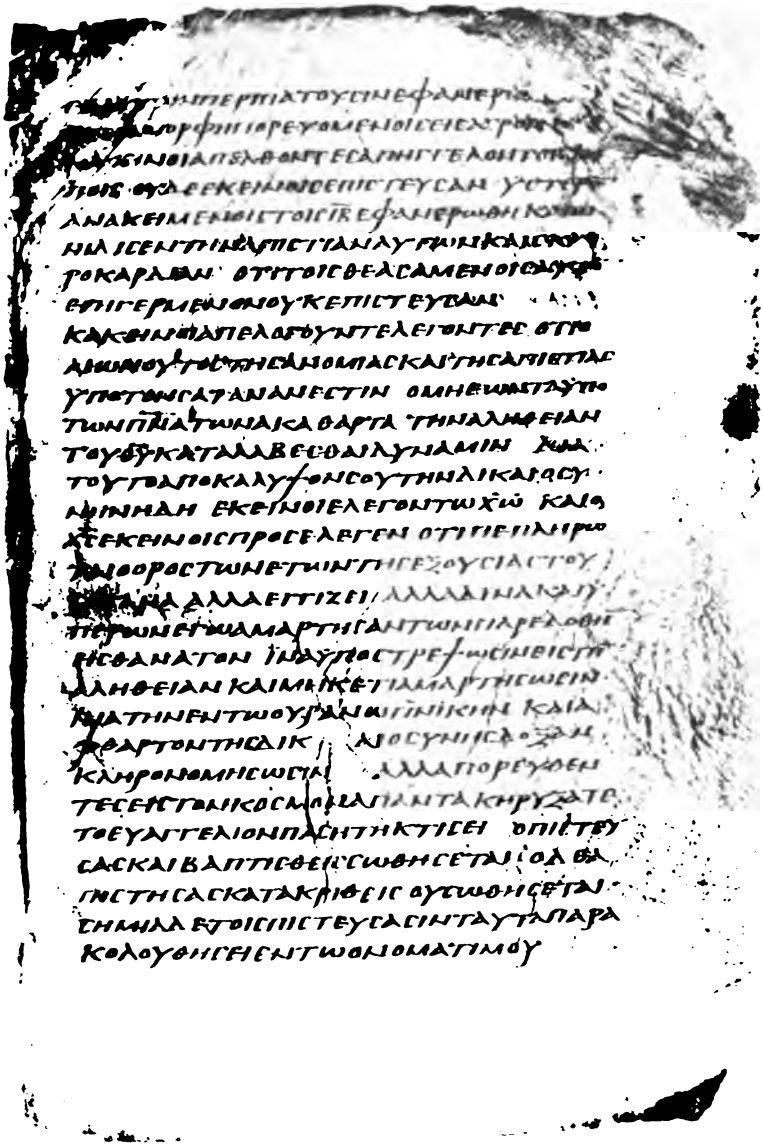

The Freer Logion.
From a facsimile furnished by Prof. Henry A. Sanders of the University of Michigan.

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14 ἵνα τὴν ἐν τῷ οὐρανῷ πν(ευματ)ικὴν καὶ ἄ
15 φθαρτον τῆς δικαιοσύνης δόξαν
16 κληρονομήσωσιν ἀλλὰ πορευθέν

In line 1 the MS reads απελογουντε and in line 10 δινα.

Lines 3, 4. Goodspeed amends to ὑπὸ τὸν Σατανᾶν ἐστιν, [τ]ὸ[ν] μὴ ἐῶντα ὑπὸ τῶν πν(ευμ)άτων [τῶν] ἀκαθάρτων. He connects this with Justin Martyr and his "plaintive demonology"; "The so-called demons strive for nothing else than to lead men away from God the Creator, and his first-born, Christ." (I Apol. 58). Thus he finds a connection with the latter half of the second century. Nestle agrees save that he deletes the ὁ and does not insert τῶν.

Lines 4, 5. τὴν ἀλήθειαν τοῦ θ(εο)ῦ κάταλάβεσθαι δύναμιν. Sanders amends by inserting και before δύναμιν. Gregory objects that ἀλήθειαν and δύναμιν are too far apart and suggests reading ἀληθινήν for ἀλήθειαν, supporting it by Jerome's "veram virtutem."

Line 9. For ἄλλα δινά most would correct to ἄλλα δεινά but some suggest ἄλλα τινά which seems less probable. The connection between lines 9 and 10 is obscure.

Line 11. Sanders amends to ὑπὲρ τῶν ἁμαρτησάντων ἐγὼ suggesting that ἐγώ is here placed twelve letters too early because the archetype had twelve letters to the line as ℵ and therefore this word, inserted above the end of one line, was copied by the scribe at the end of the preceding.

The following translation incorporates most of the suggestions of Goodspeed and Sanders:

> And they made excuse, saying, "This age of lawlessness and unbelief is under Satan, who by the unclean spirits does not allow (sc. men) power to comprehend the truth of God. For this reason reveal thy righteousness now," they said to Christ.
>
> And Christ replied to them, "The limit of the years of the power of Satan has been fulfilled, but other terrible things are near at hand. And I was delivered unto death on behalf of those who sinned, in order that they may return to the truth and sin no more, to the end that they may inherit the spiritual and incorruptible glory of righteousness (which glory is) in heaven. But go ye into all the world," etc.

As to the text of the Freer MS it seems to be singularly pure and free from late additions and corrections, although the scribe was a careless one and examples of metathesis, dittography, and slight omissions and insertions are found. As to its character and affinities. Prof. Edgar J. Goodspeed says:

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"The type of text of W is curiously heterogenious, showing three somewhat distinct strata, neutral, Western, and Syrian. Matthew and Luke, chaps. 8–24, are decidedly Syrian in type. John, and the early part of Luke (chaps. 1–7) which follows it are neutral, with some interesting Western readings interspersed; e. g., the omission of the Lucan genealogy. The primitive subscription κατα ἰωαννην is a further hint of the neutral ancestry of this part of the manuscript. Mark is decidedly Western throughout; and while its readings are often not those of D they are usually of the same general kind as they, and so illustrate Hort's feeling that the Western is as much a textual tendency as a definite textual type."

(American Journal of Theology, April 1914, p. 279.)

"In its Syrian parts it stands with Alexandrinus as a second and hardly inferior Greek witness. In its neutral parts, while less pure than B, it has sustained probably no more adulteration than ℵ, with which it shows certain external affinities; and in antiquity it ranks next after these codices among uncial witnesses. In its Western portions it is certainly no less free than D, and with its greater probable age, it promises to play an important part in further studies of the Western text." (Ibid. p. 281.)

We note it omits some, but not all of Hort's "Western non-interpolations," and in some other omissions betrays a like affinity, although in its omission of the pericope adulterae it is non-Western. And in the insertion of this logion it exemplifies one of Hort's marks of the Western MSS, readiness to adopt extraneous material.

Its date, then, that must be placed early, as its antiquity is testified to by the simplicity of its hand, its freedom from ornaments and exaggeration, and the character of the ornaments at the end. Scholars are inclined to date it in the fifth century at latest, and there seems a tendency to place it in the fourth.

As to the place from which it came, the dealer who sold it to Mr. Freer stated that it was from Akhmîm.

Dr. Carl Schmidt in 1905 bought a manuscript of I Clement in Coptic (the Akhmîmic dialect) of the fourth or fifth century, a MS of Proverbs in the same dialect and of the same date, and a Greek Easter letter of the early viii c. and all three proved to have come from the library of the White Monastery near Sohag opposite Akhmîm. He suggested (Theolog. Literaturz. 1908, p. 359) that all four of the Freer MSS came from the same source, inferring that they were found when the library was repaired. Since none of the MSS of this group are

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later than the ninth century it has been suggested that they may have been walled up and lost sight of for nearly a thousand years, since no traces of medieval meddling are found in them. This opinion of Schmidt has been adopted by Gregory, Crum, Hunt, Rendel Harris, and Goodspeed, and the latter has argued strongly for it, supporting the view by the suggestion that the subscription at the close of Mark, which now reads Timotheus, but which is evidently written over an erasure, originally read Sinotheus, for the proper name of the White Monastery is Anba Shanudah, embalming the name of the great Shenute, a leading figure in Coptic history who probably became head of this convent in 386 and who lived, we are told, until 451 A.D., dying at the advanced age of one hundred and eighteen. His importance led in time to his being looked upon as the founder of the monastery, which was given his name and retained it long after his identity was forgotten. Goodspeed would identify the Timotheus of the rewritten subscription with Timotheus Aelurus, who was probably looked upon by the monks of this convent as their rightful patriarch, though deposed and in exile (460—475 A.D.). It then becomes possible, on this theory, to believe that Sinuthius himself may have handled and read this very MS.

Prof. Sanders however declared, and still holds to this opinion in his volume accompanying the facsimile edition of the "Washington Manuscript" of Deuteronomy-Joshua (as he suggests calling the first of the Freer Manuscripts since they are later to be deposited in the Smithsonian Institute at Washington by Mr. Freer as a gift to the people of the United States) that "Timothy" here means "St. Timothy" and "All his" means "All the worshippers in his church or the inmates in his monastery." In a writer of the thirteenth century, Abu Salîh who wrote on "Churches and Monasteries of Egypt (trans. by Evetts and Butler, p. 190) he finds "Near this place there is a monastery known as the Monastery of the Vinedresser (Dair al-Karrâm), but called by the heretics the Monastery of the Dogs (Dair al Kalâb). The monastery is near the pyramids on the western side, and its church is called the Church of Timothy, the monk, a native of Memphis, whose body is buried in it." This Timothy was a Roman soldier who was martyred in the Diocletian persecution 304 A.D. He claims that among the more than seven hundred churches mentioned by the above writer, who must be dated soon after 1208, there is found no mention of any other church dedicated to Timothy.

This identification seems to us doubly precarious, first because we can by no means be sure there was no other church in Egypt at this time with the name of Timothy, and in the second place because the

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name Timothy itself in the MS is evidently written over an erasure and therefore cannot be original.

Against the White Monastery Prof. Sanders argues: first that the dealer who sold the MSS said they came from Akhmîm, and as Orientals are usually liars, this would naturally incline one to look in the opposite direction for the source. But even men who usually lie sometimes tell the truth. In the second place the MSS bought by Schmidt were papyri, while the Freer MSS are on parchment. But if the find was divided, it would be natural, as Goodspeed suggests, to make the division of them on the basis of material. We conclude then that the immediate resting place of the MSS before they were sold was the White Monastery near Akhmim.

As to the original home we are told there are indications which would connect them with some Nitrian convent. Now Jerome does not tell us where he saw the Greek MS or MSS of which he writes, but we know that in 386 A.D. he journeyed to Egypt and visited certain Nitrian monasteries. Jerome, as a textual critic, would be interested in seeing MSS of the Bible wherever he went. In this home of the Freer MS, or in a neighboring convent, a parent or sister MS, or possibly this very MS itself, may have been shown him as curious and interesting. He may have at this time copied the insertion, and later translated it into Latin, using such portion of it as was needed for his argument in his work against Pelagius. Or, since it was not a long journey from Egypt to Bethlehem, one which could be made on foot in a week, it is quite possible to think of some traveler or messenger bringing such a MS from Egypt to Caesarea, where we know there were many Egyptian MSS, where Jerome could easily have seen it.

Either of these theories would not only account for the connection between Jerome and the Freer MS but would at the same time help to explain the lack of other testimony concerning this section.

But questions concerning this logion more closely related to our investigation must now be discussed. We will consider them in the following order:

1. Its authenticity,—is it a true saying of Jesus?
2. Its integrity,—do the two parts, the apology of the apostles and the reply of Jesus belong together?
3. Its coherence or relation to the passage in which it is here found,—is it an integral part of the Longer Conclusion or an interpolation? If the latter, was it composed originally for insertion into this context, or is it an extract from another work inserted here?
4. What indications of its source and authorship can be found?
5. What is its textual significance?

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1. Is this a true saying of Jesus?

Since it does not agree with his words or his spirit we conclude that it is not. Since we possess only a Greek translation of the sayings Jesus uttered in the Aramaic, all arguments must rest on a foundation more or less insecure, nevertheless most scholars will agree:

a) Jesus would scarcely have spoken of "the limit of the years of the power of Satan."

b) Instead of τῶν ἁμαρτησάντων Jesus would have said τῶν ἁμαρτωλῶν.

c) The expression ὑποστρέφωσιν εἰς τὴν ἀλήθειαν would scarcely have been used by Jesus for repentance or conversion. It reminds us of the Johannine phraseology, but possesses no N.T. parallel. It is quite unlike the simple and direct expressions of the Synoptic Gospels.

d) The expression to "inherit the spiritual and incorruptible glory of righteousness" is "quite foreign to the New Testament, and to the words of Jesus most of all" (Goodspeed). The center of the expression "the glory of righteousness" is, it is true, simple, but scarcely like a word of Jesus.

e) As to the rhetoric in this logion, we may conclude with Gregory, "Ich glaube die meisten werden bereit sein mit mir zu sagen, daß das Knappe, Kernige, Unmittelbare, Unvermittelte, das Ziel scharf und schnell Treffende, das wir in den durch die vier Evangelisten überlieferten Aussagen Jesu finden, hier sich in keiner Weise zeigt." (Das Freer-Logion, p. 61.)

A word study of this section reveals both its dependence on our Gospels and its unlikeness to them.

Ὁ αἰὼν οὗτος reminds us of ὁ νῦν αἰὼν and its contrast: αἰὼν ὁ μέλλων in the Synoptists and Paul; and ἐάω is used in the same writings. Πνεῦμα is common in Mark; ἀλήθειαν reminds us of John, and δικαιοσύνη of Paul. As to "the power of Satan" compare Luke 10:19; Col. 1:13. With "the limit of the years . . . of Satan" compare John 12:31; 16:11. With "sin no more" compare John 5:14. Δύναμις is used of the power of God, (see Matt. 22:29; Mark 12:24; Luke 22:69) but never by Paul and the Synoptists is the expression "the power of Christ" used. Ὑποστρέφω is found in Acts 13:34; 2 Pet. 2:21, but not in this sense. It is never used in the N.T. of conversion but a parallel with ἐπιστέφω is found in Acts 26:18.

The words ὅρος, δεινός, and προσλέγω are never found in the N.T.

The expression ὅρος πεπλήρωται is as strange one, as is also "to inherit the spiritual and incorruptible glory of righteousness in

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heaven." The latter is quite foreign to the N.T. and to the words of Jesus though we recall I Peter 1 : 4, 5 εἰς κληρονομίαν ἄφθαρτον ... τετηρμένην ἐν οὐρανοῖς, etc., compare also Rom. 1 : 23 ; 2 : 7.

But in the Shorter Conclusion we read τὸ ἱερὸν ἄφθαρτον κήρυγμα τῆς αἰωνίου σωτηρίας with which may be compared Wisdom 18 : 4 δι' ὧν ἤμελλεν τὸ ἄφθαρτον νόμου φῶς τῷ αἰῶνι δίδοσθαι.

The suggestion has not been previously made, to our knowledge, that in this logion and its setting we have a remarkable parallel to Luke's account of the return of the seventy, probably an echo of it (Luke 10 : 17–20). The paragraph reads "And the seventy returned with joy saying, Lord, even the demons are subject unto us in thy name. And he said unto them, I beheld Satan (τὸν Σατανᾶν) fallen as lightning from heaven. Behold I have given you authority (τὴν ἐξουσίαν cf. τᾶς ἐξουσίας τοῦ Σατανᾶ) to tread upon serpents and scorpions (πατεῖν ἐπάνω ὄφεων cf. ὄφεις ἀροῦσιν of Mark 16 : 18) and over all the power of the enemy (τήν δύναμιν τοῦ ἐχθροῦ cf. τοῦ θεοῦ καταλαβέσθαι δύναμιν) and nothing shall in any wise hurt you (compare the expression "if they drink any deadly thing it shall in no wise hurt them" of Mark 16 : 18 although the Greek is different). Nevertheless in this rejoice not, that the spirits (τὰ πνεύματα) are subject unto you ; but rejoice that your names are written in heaven (ἐν τοῖς οὐρανοῖς cf. "to the end that they may inherit the spiritual and incorruptible glory of righteousness in heaven (ἐν τῷ οὐρανῷ).

It is further to be noted that the verse immediately preceding this paragraph, in the Gospel according to Luke (10 : 16) speaks of the "hearing" or "rejecting" of the disciples' message. It is to this that the words of the disciples, here made an excuse for themselves, originally referred, as we shall argue later.

This section, then, is based on our canonical Gospels, and on them alone, for in spite of marked differences we have abundant evidence of similarity, and it seems absurd to limit the vocabularly and expressions of a second century Christian to those found in the N.T. At the same time the marked Pauline cast of thought and expression which distinguishes this section, separates it not only from the Gospels, but from the Longer Conclusion as well, though in its Johannine elements there may seem to be a slight relationship with the latter.

2. The integrity of this section,—do the two parts of the saying, the apology of the apostles and the reply of Jesus belong together ?

We have already seen that Jerome furnishes us only the excuse of the disciples, though in a smoother and simpler form. The answer of Jesus has been found nowhere but in the Freer MS. Did this answer originally belong with the disciples' apology, or was it appended

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at a later time or added from a different source? The fact that Jerome quotes only the excuse is probably due to the purpose he had in introducing the saying, which was fulfilled in the reference to the age being under the power of Satan.

For the following reasons we conclude the two parts belonged together from the first:

a) The significance of the apology of the apostles, as of so many sayings of the disciples in the Gospels, is found in its furnishing an excuse, or occasion rather, for the saying of Jesus. As Gregory aptly says, "Ihr Teil ist, die Veranlassung zu dem Spruch Jesu zu geben. Sie kennzeichnen die Richtung, die seine Worte nehmen werden, das Ziel dessen, was er sagt." (p. 36.)

b) The answer of Jesus does correspond fairly well with the apology of the disciples. They offer as an excuse for unbelief the fact that the age is an evil one, in which Satan prevents the comprehending of the truth. Therefore they ask that the righteousness of Christ be revealed, overthrowing the power of Satan, and freeing from unbelief.

Jesus replies that the power of Satan has already reached its limit, and that already his death has made it possible for sinners to turn from unbelief to the truth and inherit the glory of righteousness. This latter portion of the words of Jesus seems to be an answer, although not a very direct one, to the request of the disciples for a revelation of his righteousness.

c) The need of the disciples at this time was for comfort for themselves and encouragement in their work. These are furnished by the answer of Jesus which declares that no longer are they in a world under Satan's power and that by his death he has made possible for sinners salvation from sin.

Our conclusion, therefore, is that the answer of Jesus originally belonged to the words of the disciples. At the same time it seems quite probable that the answer of Jesus was originally more full, and that in a part of it not quoted here it may have replied more directly to the request of the disciples for an immediate revelation of his righteousness.

3. Is this logion an integral part of the Longer Conclusion or an interpolation?

In spite of the high authority which supports the former view, we consider it an interpolation. True the rebuking of the disciples by Jesus for their unbelief and hardness of heart does offer an occasion for their excusing themselves (ἀπελογοῦντο), though the canonical Gospels furnish no example of such an attempt in connection with the

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appearances of the risen Christ. But studied closely lines 2–12 show no necessary connection with their setting, save only that they imply a time after the resurrection, as Gregory suggests. But, pushing his argument further, we claim that though they seem to be an excuse for unbelief, there is nothing in the words of the disciples, taken by themselves, which implies that this unbelief was specifically the unbelief of the apostles, and further that it was unbelief in the resurrection of their Master. If removed from the context in which we now find them, these words would most naturally be interpreted to refer to unbelief in the hearts of those to whom they were sent, which hindered the success of the apostolic mission to the world, rather than to unbelief in the hearts of the apostles themselves.

The answer of Jesus seems to suit this interpretation. He replies that the world is no longer under the power of Satan, and that he has made it possible for sinners (not disciples) to "return to the truth" and inherit the glory of righteousness. Such an interpretation of the saying of Jesus brings it into close connection with the commission which immediately follows. "But going into all the world, etc." And this commission, with the promise of salvation to those who believe, and the promise of miraculous power in the world (vs. 17, 18) for the further encouragement of the disciples, lends further support to our suggestion that the words of the disciples in this logion originally referred not to their own unbelief in the resurrection, but to the unbelief of the world which refused their message. Further this interpretation seems to suit the expression τὴν ἀλήθειαν τοῦ θεοῦ καταλαβέσθαι better than the customary explanation.

Our interpretation of this passage, therefore, leads us to adopt the suggestion of Gregory that κἀκεῖνοι ἀπελογοῦντο λέγοντες ὅτι is an editorial insertion, framed to connect a logion of Jesus with v. 14, (which would agree with the use of κἀκεῖνοι here); and that the insertion of ἀλλὰ before πορευθέντες in v. 15, of which no trace has been found in any other MS, is the work of the same editorial hand, and for the same purpose.

a) This ἀλλά since it is not found in any other MSS is itself a witness to an insertion here.

b) The lack of a direct answer to the apostles' request for an immediate revelation of the righteousness, which makes the words seem superfluous here, seems to indicate that the answer of Jesus originally contained some reply, and therefore that we have but a portion of this answer here.

c) In the Freer MS a space of about six letters is left before the introduction of this section, which thus begins at the beginning of

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the line. There is also a space of three letters at its close, but v. 15 begins on the same line, after a slight break. This seems, judging from the last page of Mark, to be the common method of indicating a paragraph or section in this MS and therefore does not imply an insertion, yet it is to be observed that it perfectly agrees with the theory of an insertion at this point.

The argument from the thought of this section is supported by the argument from style and vocabulary. We rearrange and condense the points Goodspeed makes, at times using his words:

1. The logion calls Jesus ὁ Χριστός, but in the Longer Conclusion he is called ὁ κύριος, vs. 19, 20, to which in v. 19 we must possibly add Ἰησοῦς.

2. The Logion agrees with Mark's Gospel in its frequent reference to spirits or unclean spirits, while the Longer Conclusion uses δαιμόνια vs. 9, 17.

3. The loose and superfluous ἐκεῖνοι ἔλεγον τῷ Χριστῷ which we retain, in spite of Harnack's contention that it is a marginal gloss which has slipped into the text, contrasts with the clear-cut style of the Longer Ending.

4. The feeble vagueness of "other terrible things are near at hand" further contrasts with the precision of the Longer Ending.

5. The clumsy expression "the spiritual and incorruptible glory of righteousness in heaven" is quite unlike the style of the Longer Conclusion but reminds us of the "holy and incorruptible preaching of eternal salvation," of the Shorter Conclusion.

6. The absence of this logion in all other MSS of the Gospels is strong evidence that these words did not originally form part of the Longer Conclusion.

This logion, then did not originally form a part of the longer of the two endings. Its difference in tone and style make it seem, in connection with it, like a new patch on an old garment (Goodspeed). A fortiori it does not belong to the canonical Gospel tradition.

But some would claim that it was taken from the same source which supplied the Longer Conclusion. So Harnack who, after acknowledging that the logion does not belong in the place in which it is found, would argue that it came from the source of the Longer Ending, which he holds was the tradition of Aristion through Papias. At first copied as a marginal note it later became inserted in the text.

Reasons for the rejection of the Aristion source of Mk. 16:9–20 have already been given. The marked differences between these two fragments, already pointed out, leads to the inference that they could

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not have had a common source. The Freer Logion seems to be the product of a later, a more thoughtful and philosophical age.

In rejecting the conclusion of so weighty an authority as Prof. Harnack, it is comforting to find support in so eminent a textual critic as Prof. Gregory, and one who agrees with the former in accepting the Aristion source of the Longer Conclusion. While acknowledging the possibility of identity of source, he does not accept the theory. "Denn der Abschnitt scheint durchaus nicht aus derselben Feder geflossen, aus demselben Kopf entsprungen zu sein, wie der unechte Schluss." (p. 63.)

4. But if this logion is not to be assigned to the source from which the Longer Conclusion was taken, what can be inferred as to its origin?

Concluding that the section is an extract from a longer writing, that Jerome probably knew the whole logion, having seen it in a MS closely related to the Freer MS, that possibly he saw it in 386 A.D. on his trip to Egypt, when he visited the Nitrian monasteries in addition to spending a month in Alexandria, we conclude that this writing is to be traced back to Egypt, perhaps to a Nitrian monastery.

For in spite of his words, Jerome may have seen but one MS containing this logion. It is not impossible that it is to this very MS that he refers. At least it must have been one closely related, since of all the thousands of Greek texts known to us, it has as yet been found in no other MS, proving that this reading must always have had a very limited diffusion. Probably it never traveled very far from its source. Since this MS connects it with Egypt, it is most natural, especially as on this supposition we can easily explain Jerome's knowledge of it, to posit an Egyptian origin. This we are free to do, since we have denied its coherence with the Longer Conclusion.

Gregory suggests that the writer shows that he has been influenced both in his vocabulary, and to a less extent in his thought, by Egyptian Gnosticism, but other scholars take exception to such a conclusion. The logion, however, probably formed a section of an apocryphal Gospel or "kerygma," based upon our canonical Gospels, and probably written in Egypt during the second century.

But the remarkable confusion of text displayed by this logion is scarcely what we would expect if its circulation was extremely limited. This leads Gregory to suggest that we have here a translation, possibly from a Coptic original. Such a supposition might help to explain such difficult passages as τὴν ἀλήθειαν τοῦ θεοῦ καταλαβέσθαι δύναμιν, and the lack of smooth connection between verses eight and nine and verses nine and ten.

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If this very attractive hypothesis be adopted, it supports our theory that in Egypt there were at various times various endings to Mark. Knowing this fact, an Egyptian scribe would feel more free to take liberties with the last section of the Gospel than any other, since for him the tradition which supported it was neither ancient nor universal. Therefore to the last twelve verses, which he knew found their way into the Alexandrian text at a late date, some unknown scribe made an addition from a writing known to him.

While the date of the original writing seems to be early, judged by internal considerations ; though apparently later than the composition of the Longer Conclusion, since it shows a more developed, a more speculative handling of the Gospel tradition,—probably before the beginning of the third century,—the date of the insertion of this logion into the Longer Conclusion seems relatively late, perhaps during the fourth century. It must have been prior to 415 A.D. when Jerome speaks of it in his writing. Either it was generally recognized as an interpolation by the scribes, and therefore not copied by them, or else it found a private or purely local circulation.

5. As to the significance of the Freer MS for textual criticism, it furnishes us with another witness to the fact that during the second, third, and fourth centuries it was generally known that something was the matter with the end of Mark's Gospel, and therefore the scribes were accustomed to treat this section with greater freedom than they employed toward the remainder of the Gospel. This tradition of doubtful authority seems most strong and persistent in Egypt. Therefore this latest and most important of recent discoveries confirms what we have learned from other witnesses concerning the textual transmission of the appendices of the Gospel according to Mark in that country.

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RECONSTRUCTION OF THE HISTORY OF THE CONCLUSIONS OF THE SECOND GOSPEL

The Gospel according to Mark at one time circulated in an abbreviated form, without conclusion, breaking off abruptly with ἐφοβοῦντο γάρ at the close of the eighth verse. This form was widely distributed, as is proved:

a) By ℵ, B, Ss, Arm^{codd}, Eth^{codd}.

b) By signs, breaks, or notes in various MSS which indicate that the scribes understood the Gospel, in some sense, to close with v. 8.

c) By the testimony of Eusebius, Jerome, Victor of Antioch, etc.

d) By the omission of the last twelve verses in the Eusebian Canons and the Ammonian Sections.

Was the Gospel left unfinished by its author, or was the conclusion lost by accident, or was it purposely excised?

Probably the abbreviated form of the Gospel is not due to the author since the narrative breaks off not at the end of a paragraph, or even of a sentence, but in the midst of a clause; for we read Mark 16:8 thus; "And they went out and fled from the tomb; for trembling and astonishment had come upon them: and they said nothing to any one; for they were afraid of—"

In support of this interpretation may be urged the absence of other instances in the N.T. of a sentence ending with γάρ; and the unusual use of ἐφοβοῦτο in an absolute sense, required by any other translation. Where the phrase ἐφοβοῦντο γάρ is employed elsewhere in the N.T. it is associated with some person or circumstance which is the cause or the object of the fear. Compare the following instances:

Mark 11:18 ἐφοβοῦντο γὰρ αὐτόν,
Mark 11:32 ἐφοβοῦντο τὸν ὄχλον,
Acts 5:26 ἐφοβοῦντο γὰρ τὸν λαόν,
Luke 22:2 ἐφοβοῦντο γὰρ τὸν λαόν,
Luke 19:21 ἐφοβούμην γάρ σε,
2 Cor. 12:20 φοβοῦμαι γὰρ μή πως ἐλθὼν,

Did they fear a person or a circumstance, for both are used with this expression, as the above examples show? Burkitt suggests that they were afraid of the Jews. We suggest that they were afraid of not being believed by the others if they told their story. The original sentence may have read somewhat as follows, "they feared lest they

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(the disciples) would not believe them but mock." Compare with this 16 : 11.

That same argument which renders the theory of an unfinished Gospel improbable, stands in the way of a theory of deliberate excision.

a) An excision would scarcely have been made thus awkwardly in the midst of a phrase.

b) If the excision was made for the purpose of immediately substituting the Longer Conclusion for the original ending, it would scarcely have been made at this point, leaving a manifestly clumsy juncture.

c) In case such an excision was made as has been suggested, one would naturally expect to find copies of the Gospel with the original ending persisting alongside of copies with the substituted ending, but scarcely copies without any ending. Yet we have many proofs that the Gospel circulated in the abbreviated form in various lands for several centuries.

d) It is evident that the Shorter Conclusion was composed to furnish a fitting ending for the Gospel. The Shorter Conclusion is a witness to the abbreviated form of the Gospel, since it would not have been needed where the Longer Conclusion was already known. Further, the Shorter Conclusion would not have been appended to a verse which contradicts it ("they said nothing to any one") unless previously the Gospel was known in a form which ended with v. 8. The attempt in k to alter v. 8 to conform to the Shorter Ending supports this contention.

Probabilities, therefore, indicate an accidental loss of the original conclusion. This is best explained by the supposition that the last leaf of the Gospel was lost (so Griesbach, Burkitt, and others). The last leaf of a book is most readily lost, and Martin has shown, by the example of Cursive 15, how this might have occurred. Compare also the discussion of Arabic 13. Such an hypothesis accounts not only for the breaking off of the Gospel in the midst of a phrase, but also for the three forms in which the Gospel is found : without conclusion, with the Shorter Conclusion, and with the Longer Conclusion. Adopting the signs used by Zahn, we will denote the abbreviated Gospel by A, the Shorter Conclusion by B, and the Longer Conclusion by C.

A glance at the synoptic material will show that the Gospels according to Matthew and according to Luke follow Mark as their source as far as v. 8 (Matt. 28 : 8 and Luke 24 : 8), and thereafter they follow different and divergent traditions. While it is perhaps impossible to affirm that neither can in any way reflect the Markan ending (cf.

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Schmeidel, "Gospels,"Encycl. Bibl. col. 1880), it seems probable that neither Gospel was based on the original conclusion. As Resch says: "The entire literary style of their concluding sections announce to us that they flow from sources which were hidden from the second evangelist and never opened by him." (Ausser-Canonische Parallel-texte zu den Evangelien, T. und U., X, 3, p. 449, quoted here from Conybeare's translation in the Expositor, 1894, p. 227.)

The form of Mark used by the writers of the first and third of our Gospels was probably the same as that found in ℵ, B, and Ss. The conclusion seems to have been lost from Mark before Matthew and Luke were written, that is in the first century.

However it has been argued by Rohrbach (Der Schluss des Marcus-evangeliums, der Vier-Evangelienkanon und die Kleinasiatischen Pres-byter, Berlin 1894, and Die Berichte über die Auferstehung Jesus Christi, Berlin, 1898), following up a suggestion made by Harnack (Bruchstücke des Ev. und der Ap. des Petrus), that the original ending of Mark was known to and used by the author of the Gospel according to Peter. In that apocryphal writing the concluding incident follows the narrative of Mark up to the eight verse of that Gospel, and then begins another incident with "But I, Simon Peter, and Andrew my brother took our nets, and went away to the sea; and there was with us Levi the son of Alphaeus, whom the Lord. . . ."

Since the end of the writing is lost, it still remains possible that in narrating the incident he thus introduces, the author used the Fourth Gospel, or the tradition upon which it was based. Against this it has been argued that the writer of the Fourth Gospel never mentions Levi the son of Alphaeus, and that he is referred to in this way by Mark alone (2: 14). But if the author of the Gospel according to Peter possessed the Second Gospel in its abbreviated form, what more natural than that he should wish to conclude his narrative with an account of the restoration of Peter, and take this narrative from the Fourth Gospel, or from the material which was incorporated into it. It would not be unnatural to take the names of some of the group from the Second Gospel, which he had just been following. The same might be true even if he possessed the Gospel according to Mark with one of the conclusions appended. Until the lost end of this apo-cryphal Gospel is found the question cannot be definitely settled, but internal evidence is against the hypothesis of Rohrbach. We hold therefore to the early loss of the authentic conclusion of the Second Gospel.

This inference, which will be challenged by some, is, however, only of minor importance for the present argument. The loss of the

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original conclusion of the Gospel, granted by practically all critics today, alone is of major importance to our discussion.

That the Longer Conclusion was not composed by the writer of the Second Gospel has been so frequently demonstrated, by arguments from vocabulary, style, and purpose, that it is not necessary to rehearse the proof. It was appended to the abbreviated form of the Gospel as a fitting conclusion, but was not composed for this purpose, but taken from an existing work as is shown:

a) By the abrupt beginning, without an expressed subject. Since the previous section has been speaking of the angels and the women, we would expect the name Jesus to be expressed here.

b) By the return in time to the resurrection itself, making v. 9 parallel to v. 1, and showing that here we have a new and independent account, "a condensed fifth narrative of the Forty Days." (Hort.)

c) By the introduction of Mary Magdalene as though for the first time, with the explanatory appellation "from whom he had cast out seven demons," when she has recently been mentioned by name three separate times, 15:40, 47; 16:1.

The Longer Conclusion furnishes a generalized and conventionalized narrative of the resurrection appearances, in a somewhat rhythmical structure. It is evidently based on the other Gospels and on Acts:

vs. 9—11 based on John 20:11—18.

vs. 12, 13 based on Luke 24:13—35.

v. 14 combines reminiscenses of John 20:19—29 and Luke 24:36f.

vs. 15, 16 based on Matt. 28:19 with reminiscenses of John 20:21f. and Luke 24:47.

vs. 17, 18 a brief summary of Acts, where we read of casting out demons, speaking with tongues, and taking up a serpent.

vs. 19, 20 a summary of events narrated in Acts in Johannine language.

Not only the vocabulary but the whole tone of the Longer Conclusion shows Johannine influence. The narrative is didactic rather than historical. The emphasis upon faith and belief makes it evident that the writer is tracing the slow recovery of the apostles from the unbelief evoked by the crucifixion to the final triumph of faith in the risen Christ which fits them for the proclamation of the gospel message. We have a close parallel to John xx and xxi, on which the narrative is in part based. "The historian has given place to the theologian, the interpreter of St. Peter, to the scholar of St. John." (Swete.)

Resch has attempted to prove that the Longer Conclusion goes back to a source earlier than the canon, a source used by Paul, and

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perhaps employed in other epistles (Zeitschrift für Kirch. Wissenschaft, 1889, I, p. 25f.), but form and vocabulary indicate a later rather than earlier date than the canonical writings.

The Longer Conclusion seems to have belonged originally to an apocryphal writing, possibly a gospel, perhaps a kerygma like the Kerygma Petri. The Freer Logion did not belong to this source, as has been argued. To criticize the various theories of the origin of this section offered by Resch, Rohrbach, von Dobschütz and others is not possible in this discussion, but none of these theories have been generally adopted as satisfactory or conclusive. Many of the most eminent textual critics of today accept the Aristion authorship or source of this fragment, but reasons have been given in the previous discussion for not adopting this view.

The Longer Conclusion probably originated in Asia Minor. Its form, coloring, and purpose, especially its emphasis upon faith and unbelief, all lead us to associate it with the Johannine school. External testimony confirms this conclusion drawn from internal evidence, for our first undisputed reference to it among the fathers is found in Irenaeus of Lyons in Celtic Gaul, who, in his work against Heresies (III. 10. 6) says: "In fine autem evangelii ait Marcus, Et quidem dominus Jesus," going on to quote Mark 16 : 19. We know that in his early life Irenaeus was associated with Asia Minor, and that he remembered seeing Polycarp when he was a lad. Though he had visited Rome, most probably he would follow the tradition of Asia Minor. Since his work was written 182–188 A.D. we infer that by this date the Longer Conclusion was recognized by the great churches of Asia Minor as the authoritative, authentic, and sole conclusion of the Gospel, since, in spite of his wide knowledge, Irenaeus reveals no suspicion of its genuineness.

But at a still earlier date, that is about 172 A.D., Tatian incorporated the Longer Conclusion into his Diatessaron. Tatian seems to have reached Rome about 150 A D. As pupil and associate of Justin Martyr he would naturally follow the tradition and the text of the church at Rome. We infer, therefore, that very soon after C had been appended to the Gospel it was carried from Asia Minor to Rome. The close association and frequent communication between the churches of these two sections render this antecedently probable. If we could believe that Justin Martyr, when he writes οἱ ἀπόστολοι αὐτοῦ ἐξελθόντες πανταχοῦ ἐκήρυξαν (Apol. i. 45) refers to ἐκεῖνοι δε ἐξελθόντες ἐκήρυξαν πανταχοῦ in 16 : 20 this supposition would receive strong confirmation, but though many scholars find here an early testimony to the Longer Conclusion, literary dependence seems by

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no means sure. The similarity of language may be a mere coincidence, or may be due to the use of a common source.

We conclude that the Longer Conclusion was taken from an independent writing which originated in Asia Minor; that during the first half of the second century it was added to the Second Gospel to form a conclusion. Before the middle of the second century it passed to Rome, where it soon gained currency as the only authentic conclusion of the Gospel. The authority of the church of Ephesus, the authority of the church of Rome, the intrinsic excellence of C, and current dissatisfaction with an incomplete Gospel, all tended to its early and rapid acceptance in the regions dominated by the influence of these two great churches.

The Syrian Church, whose canon presents an unusual development, probably followed the ancient tradition in her earliest version, and concluded Mark at v. 8, as is witnessed by Ss. It was Tatian who, in his Diatessaron, gave currency to the Longer Conclusion in the East, and through the Diatessaron C gained in time a place in the Old Syriac, as we learn from Sc which is to be dated about the beginning of the third century. By the time the Peshitto was issued in 411 A.D. it had so thoroughly established itself in the Syrian text that no MS of that version (with one exception) hints at any other form. In 616 A.D. Thomas of Harclea revised the Peshitto in a monastery near Alexandria, employing Alexandrian MSS for the purpose and the Shorter Conclusion is found in the margin of two MSS of the Harclean Syriac. It is quite evident that the Shorter Conclusion found its way into the Syriac from Egypt.

The Armenian, based at least to a certain extent on the Syriac, persisted in rejecting any conclusion until the Middle Ages, for the Longer Ending is scarcely found in any MSS until the thirteenth century, and is wanting in half the later ones. There is a suggestion, however, that the early form of this version knew C. Be that as it may, the Armenian Version is unique in allowing the abbreviated form of the Gospel to persist as the recognized and authentic type for many centuries, in fact until comparatively recent times.

For light upon the origin of the Shorter Conclusion we must look to Egypt whence our witnesses to this form come.

Modern criticism is inclined to recognize three early types of text as belonging to the church of Alexandria:

1. The earliest known to us is represented by the quotations found in Clement of Alexandria (cir. 190) and must therefore belong to the end of the second and beginning of the third centuries. This text is not found reproduced in any extant MS, but we know that it

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was characterized by a considerable "Western" element, of an early type.

2. The second stage is represented in the quotations of Origen and is fairly well reproduced by ℵ and B, although Origen seems also to have used MSS of an earlier type. The "Neutral" text of WH represents therefore, the second stage of the development of the Alexandrian text.

3. The third stage is represented by the quotations of Cyril of Alexandria (bishop of Alexandria 412–444 A.D.), and is found in a small group of MSS, especially C. L, Ξ, Δ, Ψ. The "Alexandrian" text of WH is therefore the third stage of the text of Alexandria, a revision of the second stage, showing a tendency to revive readings of the first stage which were rejected in the second. It may be noted that von Soden does not separate the "Neutral" and "Alexandrian" texts, but includes both in the class he calls H, and says this text has been contaminated by the Egyptian versions.

Egypt early knew and long preserved the Gospel according to Mark in the abbreviated form, as is witnessed by ℵ and B which were written there in the fourth century. Though, as we have seen, *both* betray a knowledge of a conclusion to the Gospel,—whether the Longer or the Shorter Conclusion the evidence does not show,—they nevertheless hold that the more authentic text ends at v. 8. It is possible to claim that ℵ and B give us but the judgment of the scribes who wrote them, or of the earlier archetypes from which they were copied, but the excellent text presented by them is against such a supposition. They certainly reveal the persistence until the fourth century of the tradition of the abbreviated text.

In Egypt, to this abbreviated Gospel, the Shorter Conclusion was appended, as is witnessed by L, 𝔗[12], T[1], and Ψ. It is evident that B was composed for the purpose it serves and for the place it holds, that is to furnish a fitting conclusion for the Gospel. By its contradiction to v. 8 it bears testimony to the A form, for unless a form of text had been already in circulation containing the words, "they said nothing to any one," these words would been excised or altered when B was appended. That they were early felt to be incompatible with B is shown by k and an ancestor of Bohairic Hunt. 17.

In language and conception the Shorter Conclusion differs from the Synoptics even more than does the Longer. In tone it is ecclesiastical and theological. Evidently based on Luke-Acts, or upon the history and conceptions found there, in style it is comparable to the opening verses of the Gospel according to Luke (so Dr. Hort II, p. 298). The writer also seems familiar with the epistles of Paul, and his style

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reminds us more of the epistles than of the Gospels. As Dr. Hort well says, "The vagueness and generality of the last sentence finds no parallel in the Gospel narrative." He would find suggestions for its construction in Luke 24:9–12; Mt. 28:19; Luke 24:47 and John 20:21. There is also a slight resemblance to Clement of Rome.

Because the Shorter Conclusion is more theological, ecclesiastical, and modern than the Longer, we are inclined to date it later, though recognizing that this may possibly be due to another environment or another author, rather than a later age. Since as yet we have no data to determine how long C existed in an independent composition before being added to A, it does not necessarily follow that B was added to Mark at a later date than C. Indeed, since B was evidently composed for the purpose of rounding off an unfinished Gospel, we must infer that at the time when it was written C had not become known, at least to any extent in Egypt, since it is self-evident that the meager B could never have gained large acceptance in regions where C, manifestly and immeasurably its superior, was already known. We date it therefore in the second century.

That the origin of the Shorter Conclusion belongs to Egypt our whole investigation seems to imply beyond a reasonable doubt, for the following reasons:

1. Because the four uncials containing the double conclusion, L, T^1, $\Im^{12}$, and Ψ, are from Egypt, and of these L and Ψ belong to that type of text, the so-called "Alexandrian" text, which is known to represent the third known stage of the Greek text in Egypt. We have not found a single MS containing B, either in the Greek or the versions, whose origin is certainly, or even most probably, to be traced to any other country.

2. Because the MSS showing the Shorter Conclusion are more or less closely related, as we have seen, to the text of ℵB, the so-called "Neutral" text, which represents the second known type of the Alexandrian text. All the versions in which the Shorter Conclusion is found have affiliations with this type of text, and most of them seem to have been based upon it.

It seems evident, therefore, that after the earliest type of the text of Mark, that ending with v. 8, Egypt possessed a second form which concluded the Gospel with B. This, however, was very frequently, if not usually, appended with a break or notes or a subscription, testifying to the earlier, abbreviated form of the Gospel.

A third form known in Egypt is shown by the uncials with the double conclusion. It is self-evident that in these MSS C is appended to B, and, since in all known MSS showing the double conclusion B

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precedes C, the Shorter Conclusion is still preferred. This form witnesses to a time when C found its way into Egypt from the region dominated by the church at Rome. For a long time, at least in some sections, C was compelled to struggle with its rival, which earlier possessed and still claimed the field, as is shown by the increasing number of MSS found possessing the double conclusion, and by the date of the uncials of the L type, which shows that as late as the seventh and eighth centuries MSS in which B was incorporated into the text were still deemed worthy of being employed as exemplars.

At the same time, as is witnessed by Codices A and C, MSS containing only the Longer Conclusion were known in Egypt at least as early as the fifth century, and these MSS show an excellent text. It must therefore be recognized that, while we are tracing a logical, and, doubtless to a certain extent, chronological development in this reconstruction, it is quite possible that we are not following the dominant tradition even of these early centuries. While the testimony of Eusebius, Jerome, Victor of Antioch, and others have been confirmed by recent discoveries, which prove that the tradition which held that the Gospel ended with v. 8 was of far wider acceptance than was supposed a few decades ago, and while the evidence of the MSS confirms the same facts in regard to the Shorter Conclusion, it is quite possible that B may have become very early the authoritative text of a minority, if it was not that from the beginning. This minority must have been a very respectable one, as is witnessed by the Old Latin, the Bohairic, the Sahidic, and the Ethiopic, in all of which versions it gained for a time a place. We have seen that all of these versions are to be associated with Egypt, another argument for the Egyptian origin of the Shorter Conclusion. We find, then, that we are tracing the struggle of two rival forms in the region dominated by Alexandria, and that here, in contrast to its experience in the region dominated by Rome, the Longer Conclusion gained acceptance and recognition as the sole authoritative ending of Mark only after a struggle of centuries had finally eliminated B.

But previous to this final elimination, there seems to have intervened, probably in restricted sections, a type of text which, while giving C alone a place in the text, inserted B in the margin (Cursive 274, two Bohairic MSS, and the Harclean Syriac). The Shorter Conclusion is now looked upon as an ancient and interesting variant, though of inferior authority to C. In this respect the little group of MSS reverses the judgment of the MSS containing the double conclusion, which considered B of the higher authority.

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The final stage is of course the total elimination of B and of every reference to it. The superior authority of the church at Rome and the superior excellence of C have at length won for it the struggle with its rival, and C obtains at Alexandria what it had enjoyed from the second century at Rome, recognition as the only authoritative conclusion of the Gospel according to Mark.

As has been stated, it is not our purpose to imply by this reconstruction of the history of the conclusions of Mark in Egypt that there existed five sharply defined periods, in which the five forms successively dominated the text of Alexandria. Certainly these periods overlapped, and MSS of various forms were used and copied simultaneously. It is quite possible that one or more of these forms never became dominant either in Egypt or elsewhere, and this is particularly true of the third and fourth forms, and possible even of the second form. But evidence of the existence of all these forms is given us both in Greek MSS and in the MSS of versions dominated by the Greek text of Alexandria. This evidence of the versions must now be briefly recapitulated.

The evidence of the Sahidic MS Weill 16, showing the double ending to Mark, has not, to our knowledge, been used in any previous discussion of this problem. It is of far greater significance and importance than would at first appear. That amid the three or four Sahidic fragments containing the last verses of Mark one should reveal the double ending is surprising, for it may witness to the fact that the Shorter Conclusion was at one time relatively common, if not dominant, in the version of Upper Egypt. The fact that underlying the Sahidic is a type of text apparently akin to that used by Clement of Alexandria, that is, a second century type of the Alexandrian text, increases the importance of the witness of the Sahidic. While we do not hold that the Sahidic Version originally ended with B, (to us it seems more probable that it originally ended with v. 8), in view of the note which precedes C in the Sahidic, as well as the reference to the Sahidic in the note found in one Bohairic MS (Or. 1315), it seems most probable that at one time a type of text ending with B gained more or less currency in the Sahidic Version. This form may witness to a later adaptation of the Sahidic Version to a type of text which, as we have seen, gained some currency in the Greek text of Lower Egypt. We find here therefore, an additional witness to the authority and the diffusion of our second and third stages in the development of the Greek text of Egypt.

Since writing the above, we have heard, upon excellent authority, that among the Coptic MSS in the recent acquisition to the J. Pierpont

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Morgan Library one is found to contain the double ending to Mark. As all these MSS are reported to be in the Sahidic dialect, this discovery furnishes additional support to our inference concerning the place of B in the Sahidic version. It is to be hoped that Prof. Hyvernat will soon make this evidence available for critical use.

That the Bohairic Version shows the Shorter Conclusion in the margin of two MSS, Hunt. 17 and Brit. Mus. Or. 1315, agrees with the reconstruction of the history already suggested, since critics hold that the Bohairic Version is later than the Sahidic, and was based on a later Alexandrian text, the so-called "Neutral" text. These two Bohairic MSS, therefore, are witnesses for our fourth stage, when B is relegated to the margin.

But while the witness of Hunt. 17,—which seems to include most of the readings which had at any time found their way into the Sahidic,—would not in itself imply that B was more than sporadic in this version, it is to be noted that one or more of the ancestors of this MS, as Zahn has pointed out, concluded the Gospel with B and that v. 8 was violently altered to conform to it, as in k. Therefore, while it would be rash to conclude that B at one time formed the sole and authoritative ending of Mark in the Bohairic Version, we are justified in declaring that there existed MSS of this type in the Bohairic. Further, as the note "In the Copy of the Sa'îd," of Or. 1315 proves, the Shorter Conclusion in the Bohairic was held to be related in some way to the Sahidic Version, whether to the extent of being derived from it, or simply being looked upon as similar to it, we cannot say.

In the Ethiopic Version we have a group of MSS showing A, another group showing B, and a third A+B+C, a further confirmation of the Egyptian origin of the Shorter Conclusion, although we again suggest that possibly the original form of the Ethiopic ended with v. 8. There is a possibility that the Gospels were brought to this region at the first from Palestine, rather than from Egypt.

The Old Latin Version of Roman North Africa, as represented by k is unique in showing us a version from which we have a MS which exhibits the Shorter Conclusion alone. Since this version, as represented by k and e, seems based on the Alexandrian rather than on the Roman type of Greek text we infer that here also the Shorter Conclusion was introduced from Egypt. Whether B formed the recognized conclusion of Mark as read by Cyprian in Carthage († 250), is not certain, since e, the only other MS representing this recension, lacks the close of the Gospel. But that the B form was not introduced by the scribe of k, even though he was probably an Egyptian, seems certain from the careless and inaccurate manner in which these lines are written in

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this MS. The mistakes are incredible in a translator. They must be due to the heedlessness of a copyist. Therefore, whether the B form is original in the Old Latin of North Africa or not, it certainly was found in a group of MSS which are to be dated as early as the fourth or fifth centuries. And if the O.L. did not originally possess B, it ended with v. 8 as did ℵ, B, and Ss. However, the fact that k alters v. 8 to conform to B slightly increases the probability that k represents the original form of the African Latin, and that this alteration was made at the time of translation, since no trace of it has been found in any Greek MS.

That in the Sahidic and Bohairic C ultimately superceded B is easily explained by the history of the Greek text of Egypt, to which it would naturally be conformed, by being revised from time to time. That all the O.L. versions save that of North Africa contain C alone is in harmony with the fact that they are of later origin, and were made from the authoritative text of the church of Rome. It is possible, however, to argue that all the versions containing B originally possessed the A form and that the B form was introduced into later MSS from Egypt, either immediately or ultimately.

Though the limits of our discussion forbid a full investigation of the patristic evidence, both positive and negative, this evidence has not been forgotten, and it is believed that the theory advocated does not conflict with these witnesses, but is supported by them.

Eusebius, in his Quaest. ad Marin. ap. Mai, nov. patr. bibl. iv, p. 255f., in answering the question of Marinus, "How is it that in Matthew the Saviour appears as having been raised up ὀψὲ σαββάτων [xxviii, 1], but in Mark πρωὶ τῇ μιᾷ τῶν σαββάτων"? suggests a possible escape through textual criticism, as follows:

> ὁ μὲν γὰρ τὴν τοῦτο φάσκουσαν περικοπὴν ἀθετῶν εἴποι ἂν μὴ ἐν ἅπασιν αὐτὴν φέρεσθαι τοῖς ἀντιγράφοις τοῦ κατὰ Μάρκον εὐαγγελίου. τὰ γοῦν ἀκριβῆ τῶν ἀντιγράφων τὸ τέλος περιγράφει . . . ἐν τοῖς λόγοις . . . ἐφοβοῦντο γάρ. ἐν τούτῳ γὰρ σχεδὸν ἐν ἅπασι τοῖς ἀντιγράφοις τοῦ κατὰ Μᾶρκον εὐαγγελίου περιγέγραπται τὸ τέλος, τὰ δὲ ἑξῆς σπανίως ἔν τισιν ἀλλ' οὐκ ἐν πᾶσι φερόμενα περιττὰ ἂν εἴη.

Dr. Hort Translates (II, Notes, p. 31):

"For one man, rejecting the passage itself, the section which makes this statement, will say that it is not current in all the copies of the Gospel according to Mark. That is the accurate copies determine the end of the narrative according to Mark at the words . . . ἐφοβοῦτο γάρ. For at this point the end of the Gospel according to Mark is

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determined in nearly all copies of the Gospel according to Mark; whereas what follows, being but scantily current in some, but not in all [copies], will be redundant [i. e. such as should be discarded], and especially if it should contain a contradiction to the testimony of the other evangelists."

Eusebius, therefore, strictly interpreted, declares that the best and largest number of Greek MSS concluded the Gospel with v. 8. This testimony applies of course only to those MSS with which he was himself conversant. However, it is significant that the Eusebian Canons, according to the more ancient and trustworthy MSS, do not include vs. 9–20, and that the Ammonian Sections also omit them.

The testimony of Eusebius is echoed nearly a century later by Jerome in his work "Ad Hedibia," (120 Vall.). This work was written at Bethlehem in 406 or 407 A.D. After a question, which seems a free presentation of that put into the mouth of Marinus by Eusebius, he says:

> "Hujus quaestionis duplex solutio est; aut enim non recipimus Marci testimonium, quod in raris detur evangeliis omnibus Graeciae libris pene hoc capitulum non habentibus, praesertim quum diversa atque contraria evangelistis ceteris narrare videatur; aut hoc respondendum," etc.

Victor of Antioch († 400) seems also to echo this testimony of Eusebius, and does not expound the last twelve verses in his commentary on Mark, though in some editions a commentary and scholium affirming the authenticity of these verses has been added from an anonymous source.

Burgon surmised that this witness of Eusebius was ultimately derived from Origen, and Hort seems to agree, remarking that it would carry the witness back to an earlier date, and a greater textual authority.

This seems to us most probable, since we have already seen that the abbreviated form of the Gospel was apparently more prevalent and persistent in Egypt than in other regions. On this hypothesis, the real witness of these words of Eusebius is to the fact that the largest number, and those the best in text, of the Greek MSS known to Origen were in the abbreviated form. This is just what we would have expected, since Origen would probably rank the authoritative text of Alexandria above that of Rome, and be more familiar with Egyptian than with western MSS. At the same time Eusebius would not have used this statement unless it was measurably true in his own day.

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Jerome, likewise, would not have repeated this statement unless he too was familiar with MSS of this type. The Freer Logion helps us to interpret this testimony of Jerome, for it renders it almost certain that Jerome saw the MS or MSS which contained this logion in Egypt, or found it in one or more MSS brought from Egypt. Very probably then, in quoting the testimony of Eusebius, Jerome is thinking especially of MSS brought from Egypt, or at least of MSS of the type found most abundantly there.

This testimony of Jerome has been belittled by the defenders of the authenticity of the Longer Conclusion because, after expressing these doubts concerning the last twelve verses, he gave them a place in the Vulgate, without indicating that there was any question as to their authenticity. But, in revising the Old Latin for this purpose, Jerome would most naturally follow the tradition of the church of Rome, which early received them as the authentic conclusion of the Gospel. Whatever the evidence of the MSS of the East, Jerome would be well aware that these verses could be omitted from his version only at the cost of raising a great outcry against it in the West, on the ground that it mutilated the Second Gospel. This practical consideration is quite sufficient to explain his action. Though practically all textual critics now consider these verses unauthentic, what modern editor would dare omit them from a version prepared for popular use?

The Egyptian origin of the Shorter Conclusion has been suggested by Hort, Zahn, Nestle, and others but, so far as we are aware, the Egyptian provenance of this fragment has not been proved by any English or American writer. In fact so recently as 1908, the Bishop of Moray, writing upon the Gospel according to Mark in Hastings' Dictionary of Christ and the Gospels, says concerning the author of the Shorter Conclusion, "Swete conjectures that he was a Westerner, because of the emphasis laid on the West. Nestle makes him an Egyptian, without giving reasons (Hastings DB. III. 13)."

The conjecture of Swete is given in "The Gospel according to St. Mark," 1898, p. ci. After presenting the textual evidence, he says concerning the Shorter Ending:

> "Perhaps it may without rashness be attributed to a Roman hand; a Western origin is suggested by the pointed references to the westward course of the Apostolic preaching."

This seems very slender evidence upon which to base such a conclusion, since it would be as well known to a Christian writer of the second century as of the twentieth that historically the gospel did travel from the East to the West. As has been suggested to the

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writer, upon such a basis one might argue that the author of the anonymous prophecy called in our Bible "Malachi," wrote in Rome, for he says, "From the rising of the sun even unto the going down of the same, my name shall be great among the Gentiles." (Mal. 1:11.) We might even argue that the writer of this prophecy was not a Jew at all but a Gentile.

During the course of this investigation, it has been a constant source of surprise to find that every assured fact gleaned from the history of MSS and from the families of text to which these MSS belong, point to Egypt as the original home of the Shorter Conclusion. Not only do the Greek MSS in which it is contained come from that country, but the versions in which it is known associate themselves with the same section, and the texts represented in the MSS and underlying the versions are all more or less closely associated with the types of text found in Alexandria.

No textual evidence has been found which would certainly associate the Shorter Conclusion with Rome. On the contrary, the testimony of all the Greek uncials and all the versions associated with the authority of Rome seem uniformly to support the authenticity of the Longer Conclusion.

The suggested Roman acceptance of the Longer Conclusion and the Alexandrian origin of the Shorter Conclusion agree with the testimony of the Fathers, newly discovered MSS, the Freer Logion, and the recognized fact that there early arose a difference between the text of the Gospels as read at Rome and at Alexandria.

Realizing that the question of the authenticity of either of these conclusions is no longer in debate among critics, and that the Shorter Conclusion is, in itself, unimportant, this fresh study of the problem has been undertaken with the hope that through it a little additional light might be thrown upon the history of the New Testament in the early Christian Church.

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